SONY

DIGITAL VIDEOCASSETTE PLAYER

DNW-A65/A65P

BETACAM SX

MAINTENANCE MANUAL Part 1

1st Edition (Revised 1)

Serial No. 10001 and Higher: DNW-A65

Serial No. 40001 and Higher: DNW-A65P

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Attention-when the product is installed in Rack:

1. **Prevention against overloading of branch circuit**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

2. **Providing protective earth**
   When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

3. **Internal air ambient temperature of the rack**
   When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

4. **Prevention against achieving hazardous condition due to uneven mechanical loading**
   When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

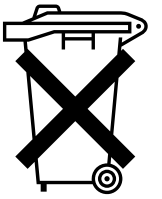
Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Voor de klanten in Nederland

Dit apparaat bevat een $(CF)_n$-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual part 1 of digital videocassette player DNW-A65/A65P.
This manual is intended for use by trained system and service engineers, and provides the information that is required to install and maintenance information.

Contents

This manual is organized by following sections.

Section 1 Installation
Explains the information that is required to install (environment, connection information, initial setting, etc.).

Section 2 Service Overview
Explains fundamental area of the information that is required to service, (removal of cabinet and cassette compartment, the functions of printed circuit board, the locations of main part, fixture and measuring equipment information, notes, etc.), the measures against trouble and ISR (Interactive Status Reporting).

Section 3 Error Message
Explains the error messages.

Section 4 Maintenance Mode
Explains each menu of the maintenance mode.

Section 5 Periodic Maintenance and Inspection
Explains the recommended periodic maintenance, the cleaning procedure and the video head tip protrusion check procedure.

Section 6 Spare Parts
Describes the spare parts list and the exploded view for the service parts of this unit, and the packing materials and supplied accessories list.

Appendix A Setting Check Sheet
The sheet is used for checking the setup conditions such as switch, setup menu under the application.

Appendix B Circuit Description and Block Diagram
Describes the circuit description and overall block diagram.

Related manuals

Besides this “maintenance manual part 1”, the following manuals are available for digital videocassette player DNW-A65/A65P.
If these manuals are required, please contact your local Sony Sales Office / Service Center.

- **Operation Manual (Supplied with the DNW-A65/A65P.)**
  This manual is necessary for application and operation (and installation) of the DNW.

- **Maintenance Manual Part 2 (Available on request)**
  Volume-1 : Service Instruction
  Volume-2 : Parts List
  Volume-3 : Diagrams

  These manuals describe the information that premises the parts level service (adjustments, board layouts, schematic diagrams, detailed parts list, etc.) for this unit.

- **Protocol Manual of Remote (9-pin) Connector (Available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote).

- **Interface Manual of Parallel I/O (50-pin) Connector (Available on request)**
  This manual explains the protocol for controlling the VTR via the parallel (50-pin).

- **ISR Protocol Manual (Available on request)**
  This manual explains the ISR function (Interactive Status Reporting / Integrated Equipment Management Function).

- **“Semiconductor Pin Assignments” CD-ROM (Available on request)**
  This “Semiconductor Pin Assignments” CD-ROM allows you to search for semiconductors used in this unit.
  Semiconductors that cannot be searched for on this CD-ROM are listed in the maintenance manual part 2 (volume-3) for the corresponding unit. The maintenance manual part 2 (volume-3) contains a complete list of all semiconductors and their ID Nos., and thus should be used together with the CD-ROM.
  Part number: 9-968-546-XX

Trademarks

Trademarks and registored trademarks used in this manual are follows.

• DOLBY is a trademark of Dolby Laboratories Licensing Corporation.

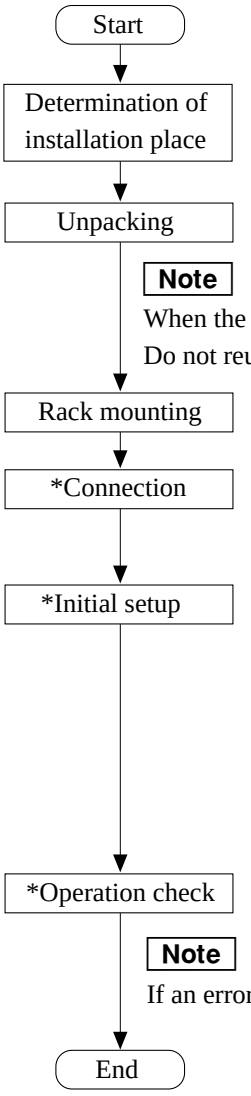
Section 1
Installation

1-1. Installation Procedure

Installation procedure of this unit is shown on the following flowchart.
Refer to each section about detail of each flow.
The operation manual is also required to do ∗-marked flow.

1-2. Supplied Accessories

9 pins remote control cable (RCC-5G) 1
Screws for rack mounting (PSW 4 × 16) 4
Operation manual 1
Maintenance manual (Part 1) 1



1-3. Operating Conditions
1-4. Power Supply
1-5. Installation Space

Note

When the unit is transported, it is required to pack the unit into the specified new packing materials. Do not reuse the packing materials.

1-6. Rack Mounting

1-7. Matching Connectors and Cables
1-8. Signal Inputs and Outputs

1-9. Switch Settings on Connector Panel
1-10. Switch and Shorting Plug Settings on PC Boards
1-11. Switching Search Dial Mode
1-12. Reference System
1-13. Settings and Adjustment when External Equipment is Connected

Note

If an error message appears on the time data display area, refer to “3. Error Message”.

1-3. Operating Conditions

CAUTION

Good air circulation is essential to prevent internal heat build-up. Place the unit in location with sufficient air circulation.
Do not block the ventilation holes of the cabinet and the front and rear panels.

Operating temperature: 5°C to 40°C
Operating humidity: 25% to 80% (non-condensing)
Storage temperature: −20°C to 60°C
Locations to avoid:

- Areas where the unit will be exposed to direct sunlight of any other strong lights.
- Areas near heat sources.
- Dusty areas or areas subject to vibration.
- Areas with strong magnetic field.
- Areas with much electrical noise.
- Areas with much static electricity.
- Areas that is impossible to find a specified room for installation. (Refer to “1-5. Installation Space”.)
- Areas windtight.

Tilt allowance: Within 30° (Do not slant the front and rear of the unit more than 30°.)

CAUTION

Fix the unit securely to avoid drop when the unit is operated at not-horizontal place.

1-4. Power Supply

1-4-1. Voltage and Power Requirements

This unit’s power line has a switching regulator.

CAUTION

Be sure to operate the unit within the range of following power voltage.

Power voltage: AC 100 to 240 V ±10%
Power frequency: 50 Hz or 60 Hz
Power consumption: 195 VA
Rush current: Power voltage 100 V IN; 10 A
Power voltage 240 V IN; 20 A

Note

AC power supply is required a capacity which is commensurate with rush current.
If the capacity of the AC power supply is not enough, the breaker of AC power of a supply side may operate or this unit may not operate normally.

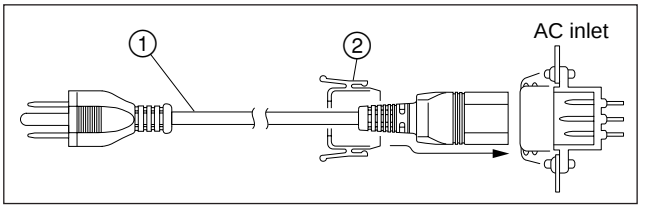
1-4-2. Power Cord

This unit does not come with a power cord.
To get a power cord, please contact your local Sony Sales Office/Service Center.

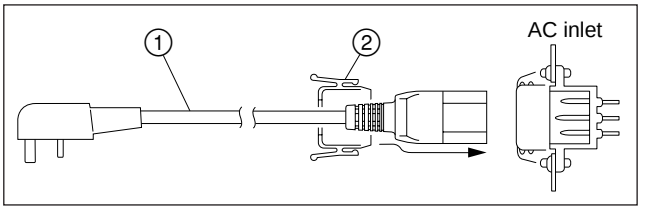
WARNING

Use the specified power cord only when connecting the AC power.
Never use a injured power cord.

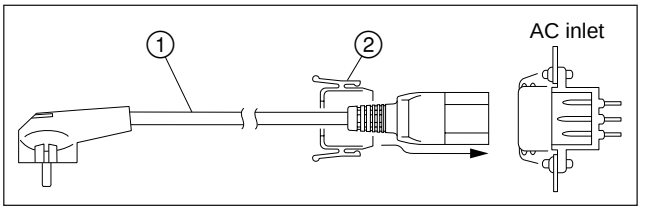
For customers in the U.S.A. and Canada:
① Power cord 125 V 10 A (2.4 m) : ⚠ 1-557-377-11
② Plug holder (Brown) : 3-613-640-01



For customers in the United Kingdom:
① Power cord 250 V 10 A (2.4 m) : ⚠ 1-782-165-11
② Plug holder (Brown) : 3-613-640-01



For customers in European countries except the United Kingdom:
① Power cord 250 V 10 A (2.4 m) : ⚠ 1-782-164-11
② Plug holder (Brown) : 3-613-640-01



If the unit is used in the area except above, please contact your local Sony Sales Office/Service Center.

1-5. Installation Space

When installing, the installation space must be secured in consideration of the ventilation and service operation.

- Do not block the ventilation slots (at the upper lid, right side panel, and bottom plate), and vents of the fans.
- Leave a space around the unit for ventilation.
- Leave more than 40 centimeters of space in the rear of the unit to secure the operation area.

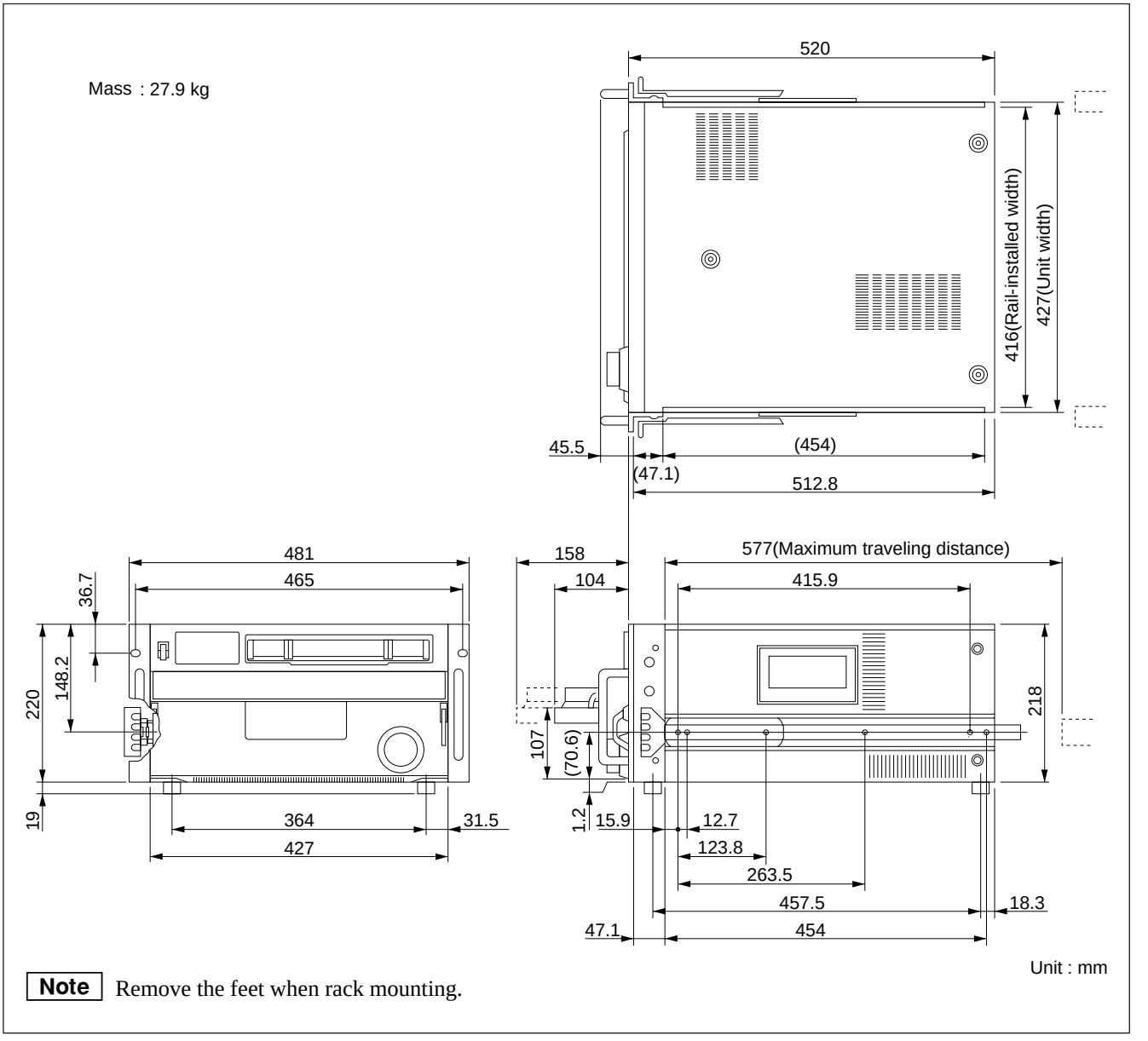
When the unit is installed on the desk or the like, leave at least four centimeters of space in the upper and right sides. Living 40 centimeters or more of space above the unit is recommended for the service operation.

When the unit is mounted in the rack, leave a space on the top or bottom of this unit by 1U.

Moreover, an air flow that is effective in cooling the unit is essential. If the ventilation is not enough, the unit may be damaged because of an increase of the internal temperature.

Note

This unit is air-cooled by the three fans. The operation with the upper lid is removed affects the air cooling by the fans. Complete the work in a short time as far as possible when operating the unit for inspection with the upper lid removed. If it takes a long time, blow to the unit by an electric fan to cool the unit.



Note Remove the feet when rack mounting.

Dimensions when Rack-Mounting

1-6. Rack Mounting

Explains how to mount this unit into a 19-inch standard rack.
Be sure to mount this unit into a rack accurately following the procedure and notes mentioned below.

CAUTION

- Use the specified rack mount rail.
  The use of other rail of low-strength may drop the unit and cause the risk of injury.
- To prevent toppling over the rack, fix it on the horizontal and firm floor securely with bolts, etc.
- Mounts the unit into a rack with a steady posture.

Note

- When other equipment with built-in hard disk drive are already mounted in the same rack for mounting this unit, turn off the power of the equipment before mounting this unit.
- Connect long enough cables on the connector panel, considering that the unit is pulled out from the rack.
- Do not operate this unit without the upper lid and bottom plate except when servicing it.
- To reduce an increase in the internal temperature of this unit, leave a space on the top or bottom of this unit by 1U.
- Adjust the temperature inside the rack within the range of the unit's operating temperature.

Specified Rack Mount Kit

RMM-111 (Optional accessory) or
RMM-110 (Optional accessory)

The color of rack angle of RMM-111 fits to the unit.
RMM-110 is the same consistance, strength and dimension as RMM-111, but the color of rack angle is different.

Note

To mount this unit in the FLEXICART, it is recommended to use the BKFC-53/2.

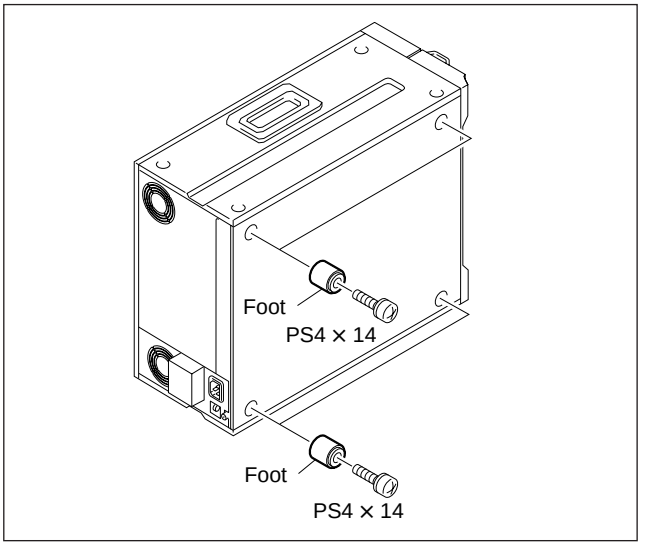
Parts Packed in RMM-110/111

- Slide rails 2
- Rack angles (handles) 2
- Rail brackets 4
- Plate nuts (large) 4
- Plate nuts (small) 4
- Screws (PSW4 × 16) 4
- Screws (B4 × 8) 8
- Hexagon socket head cap screws 8
- Flat washers 8
- Screws (RK5 × 14) 2
- Ornamental washers 2
- L-shaped hexagon wrench 1

Rack Mounting Procedure

• Removing the feet

1. Set the unit with its side panel down.
   Note
   Lend your hand so that the lower handle does not hang down.
2. Unscrew the four screws to remove the feet from the bottom plate of the unit.
3. Set the unit in a horizontal position.



Note

Keep these screws and the feet.
When operating the unit after demounting it from the rack, be sure to reattach the feet.
Tightening torque: 98×10^{-2} N • m {10 kgf • cm}

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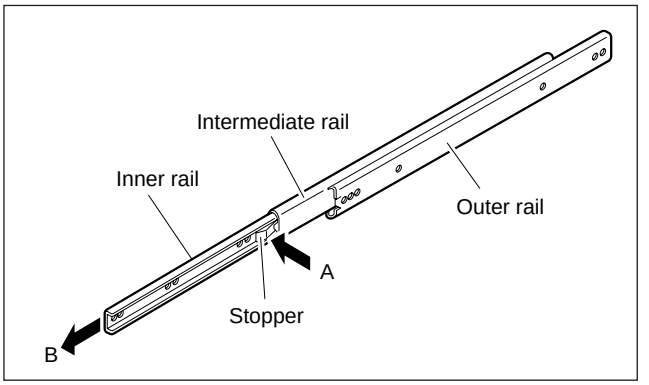
• Attaching the inner rails

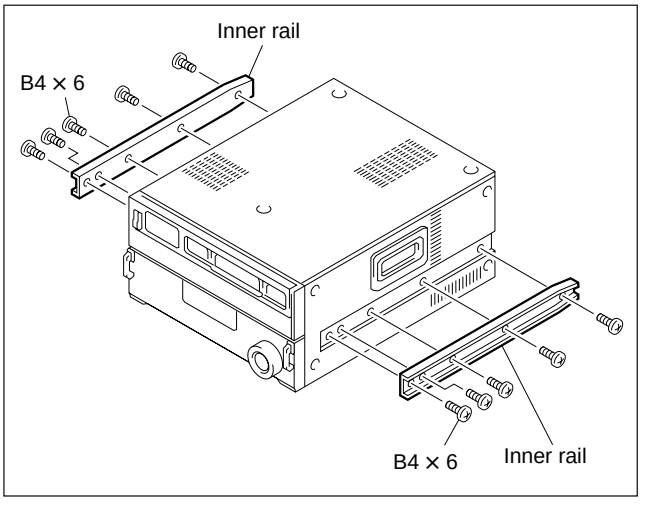
4. Pull the inner rails out from the two intermediate rails.
5. While pressing the stopper of the inner rail in the direction of the arrow A in the figure, pull the inner rail out in the direction of the arrow B.



6. Remove the ten screws from both sides (left and right) of the unit as shown in the figure below.
7. Attach the two inner rails to both sides (left and right) of unit with the removed screws in the step (6).
   Tightening torque: 120 × 10^{-2} N • m {12.2 kgf • cm}

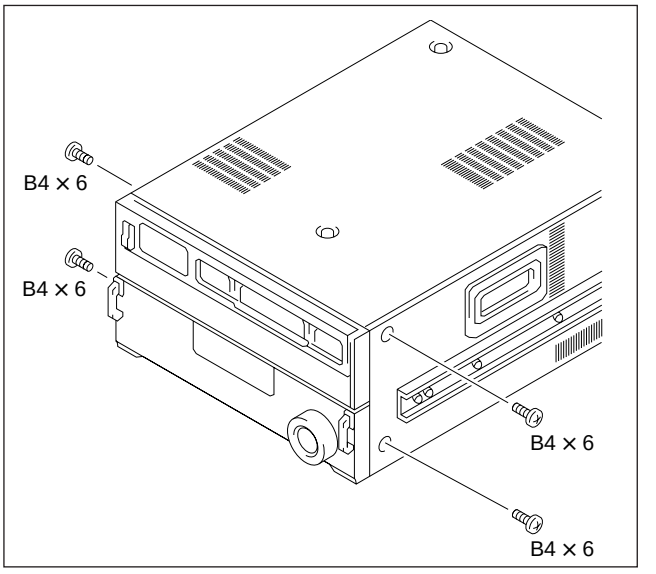
Note

Be sure to use the (B4 × 6) screws when attaching the inner rail. The use other-sized screws may cause a malfunction of the unit.



• Attaching the rack angles (handles)

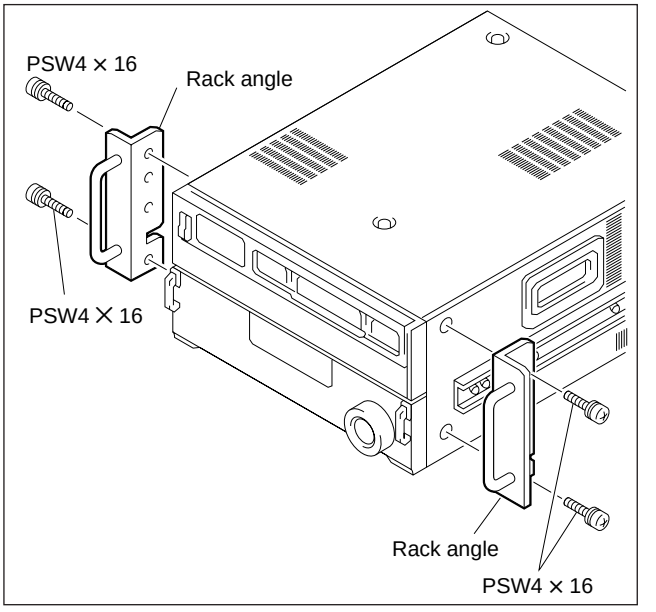
8. Remove the four screws from both sides (left and right) of the unit.



Note

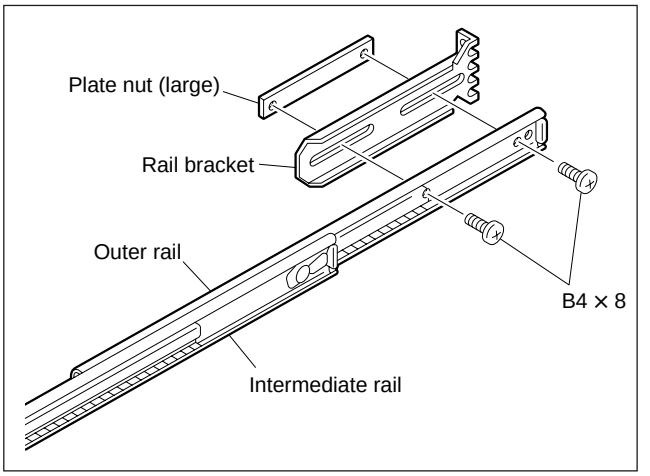
Keep these screws (B4 × 6).
Be sure to use these screws when directly fixing the side panels without the rack angles.
The use of longer screws such as the screws (PSW4 × 16) for fixing the rack angles will cause a malfunction of the unit.

9. Attach the two rack angles to both sides (left and right) of the unit with the supplied four screws (PSW4 × 16).
   Tightening torque: 120 × 10^{-2} N • m {12.2 kgf • cm}

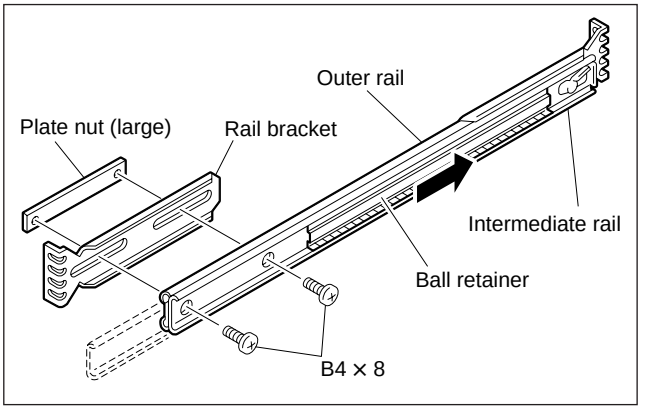


• Loosely attaching the rail brackets

10. Slide the intermediate rail as shown in the figure, and then loosely attach the rail bracket to the outer rail with a plate nut (large) and the two screws.



11. Slide the ball retainer in the direction of the arrow, loosely attach the rail bracket to the outer rail with a plate nut (large) and the two screws.

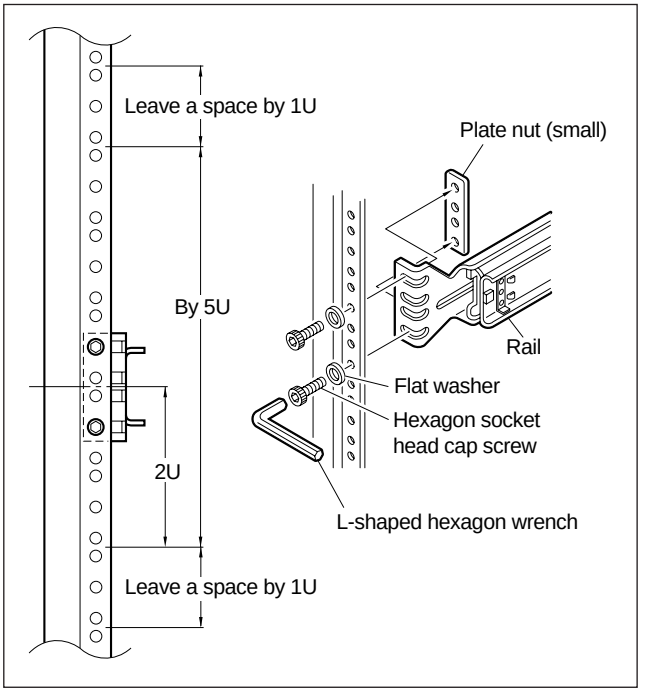


• Attaching the outer rails

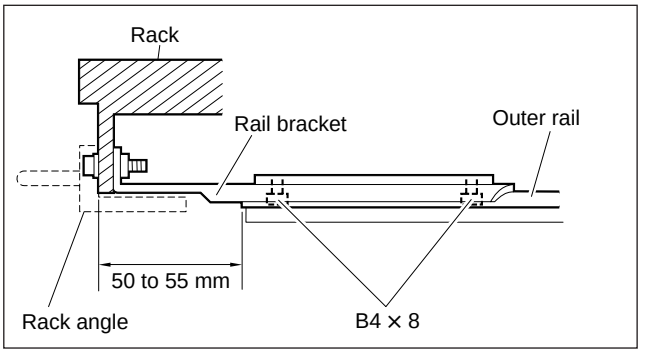
12. Loosely attach each outer rail to the 2U position from the bottom of the 5U space in the rack for installing this unit, with the eight hexagon socket head cap screws, eight flat washers, and four plate nuts (small).

Note

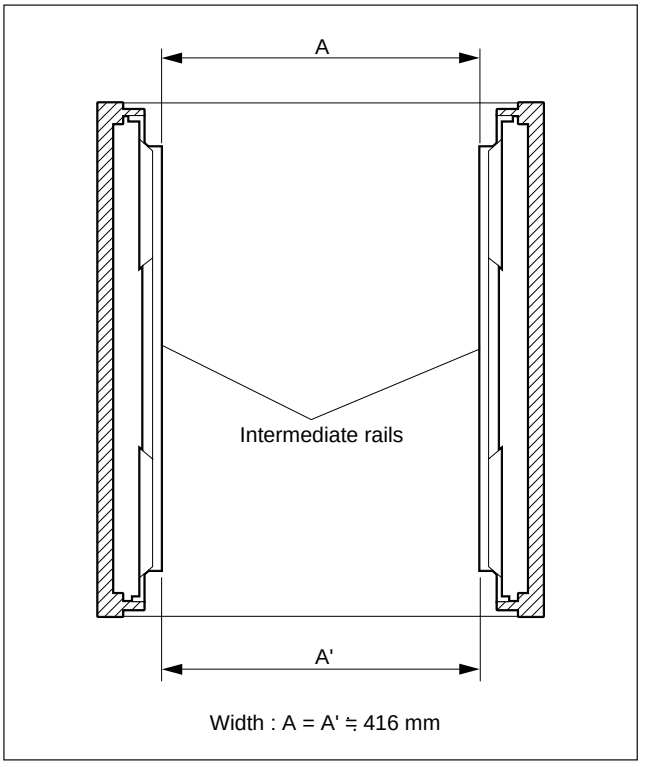
Leave a space on the top or bottom of this unit by 1U to reduce an increase in the internal temperature of this unit.



13. As shown in the following figure, adjust each front-side position of outer rails on both sides (left and right) so that the distance from the surface of the rack to the tip of the rail becomes within the range of 50 to 55 milimeters.
14. Fully tighten the eight screws (B4 × 8) fixing the four rail brackets.
    Tightening torque: 120×10^{-2} N • m {12.2 kgf • cm}



15. Check that the two intermediate rails attached to the rack are parallel.



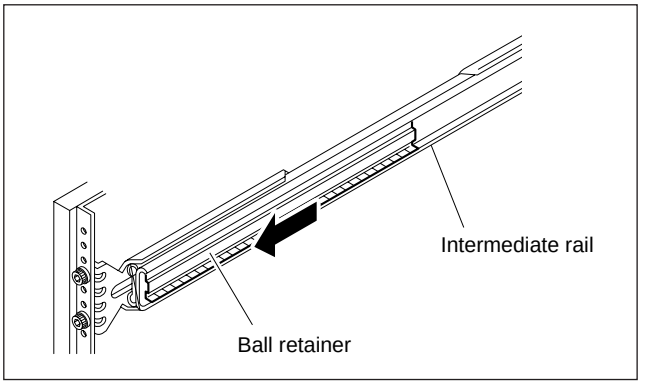
16. To fix the two outer rails to the rack, fully tighten the eight loosely fitted hexagon socket head cap screws in step 12 using the L-shaped hexagon wrench.

• Mounting in rack

CAUTION

Be sure to carry the unit by the two persons or more.

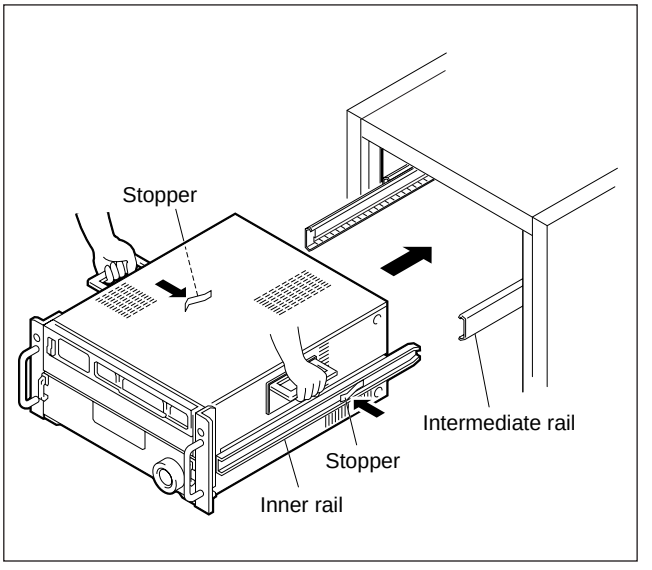
17. Slide each ball retainer of intermediate rails on both sides (left and right) in the direction of the arrow.



18. Pull equal length of each rail on both sides out.
19. Lift the unit holding the handles, slowly insert the inner rails into the intermediate rails.
20. While pressing each stopper of inner rails on both sides, slowly push the unit into the rack.

Note

Be careful not to catch your finger or hand in rack mount rail.



21. Slide the unit in and out from the rack about three times and check that the slide rails move smoothly. If they are not smoothly, demount the unit and go back to “Attaching the outer rails” (step 12).

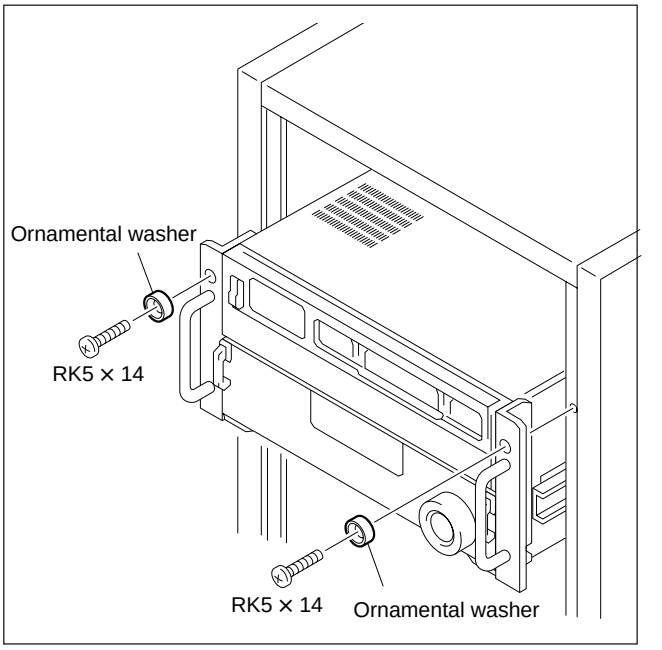
CAUTION

When demounting the unit, carry it by the two persons or more.

Note

This unit does not have the feet at this operating. Put down this unit on the floor or other, being careful not to damage the unit.

22. Secure the unit to the rack with two screws and two ornamental washers.
Tightening torque: 120×10^{-2} N • m {12.2 kgf • cm}



1-7. Matching Connectors and Cables

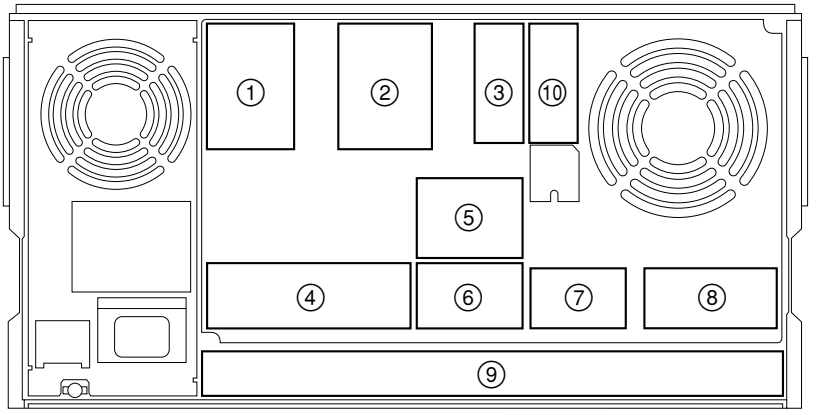
When external cables are connected to the connector of this unit, the hardware listed below (or equivalents) must be used.

Panel indication	Matching connector (cable)	Sony part No.
VIDEO INPUT	BNC 75Ω, MALE	1-569-370-12
VIDEO OUTPUT	BNC 75Ω, MALE	1-569-370-12
SDI	BNC 75Ω, MALE *1	1-569-370-12
SDTI (OPTION) *2	BNC 75Ω, MALE *1	1-569-370-12
AUDIO OUTPUT	XLR 3P, FEMALE	1-508-083-00
AUDIO OUTPUT (AES/EBU)	BNC 75Ω, MALE *3	1-569-370-12
TIME CODE OUT	XLR 3P, FEMALE	1-508-083-00
MONITOR OUTPUT	XLR 3P, FEMALE	1-508-083-00
VIDEO CONTROL	D-SUB 15P, FEMALE and JUNCTION SHELL 15P	1-561-610-21 1-561-929-00
RS-232C	D-SUB 9P, FEMALE	1-563-815-21
REMOTE1-IN (9P)	9P remote control cable (RCC-G series) *4 or D-SUB 9P, MALE and JUNCTION SHEEL 9P	 – 1-560-651-00 1-561-749-00
REMOTE1-OUT (9P)	9P remote control cable (RCC-G series) *4 or D-SUB 9P, MALE and JUNCTION SHEEL 9P	 – 1-560-651-00 1-561-749-00
REMOTE 2 PARALLEL I/O (50P)	D-SUB 50P, MALE and JUNCTION SHELL 50P	1-565-516-11 1-563-379-11
CONTROL PANEL	D-SUB 29P cable *5	–
PHONE *6	JM-60 stereo phone plug	–

∗1: Coaxial cable length : max. 200 meters (Reference value based on DNW series)
It is recommended to connect the BELDEN8281 cable or equivalent to this connector.
∗2: SDTI (SX) OUTPUT connectors are supplied with optional kit BKNW-118.
SDTI-CP OUTPUT connectors are supplied with optional kit BKNW-124.
∗3: Coaxial cable length : max. 600 meters (Reference value based on DNW series)
It is recommended to connect the BELDEN8281 cable or equivalent to this connector.
∗4: A piece of RCC-5G cable (5 meters) is supplied with this unit.
∗5: Supplied with optional control panel extension kit BKNW-122.
∗6: It exists on the front (upper control panel).

1-8. Signal Inputs and Outputs

< Reduced drawing of rear panel >



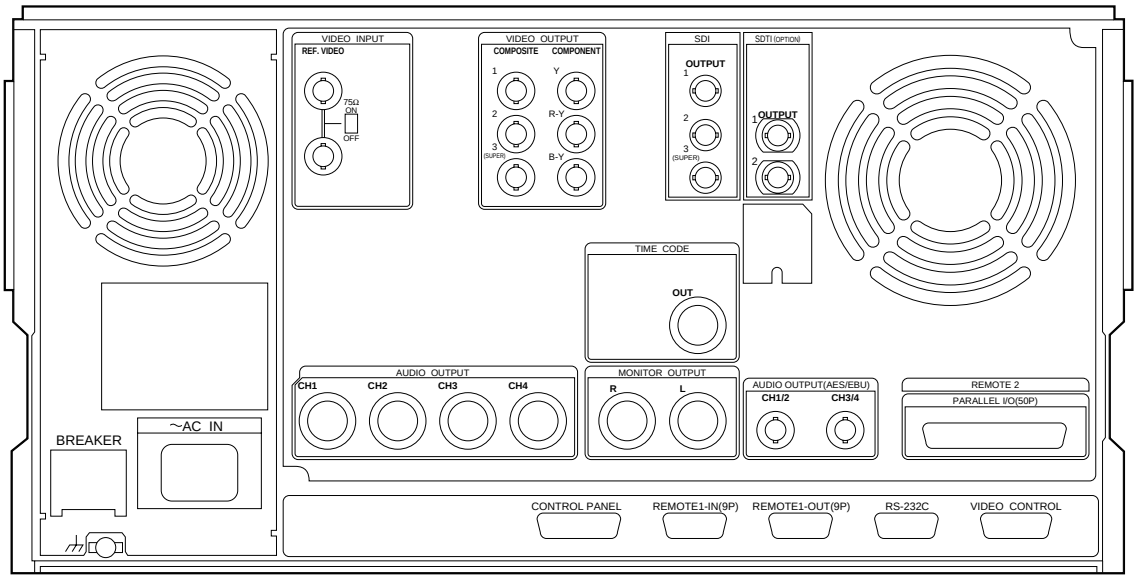
Remote connectors

⑧ REMOTE PARALLEL I/O (50P) *	D-SUB 50P connector (Refer to Optional “Interface manual” for details.)
⑨ VIDEO CONTROL	D-SUB 15P connector for a TBC remote controller (BVR-50) connection
⑨ RS-232C	D-SUB 9P connector (RS-232C interface) for ISR (Interactive Status Reporting)
⑨ REMOTE1-OUT (9P)	D-SUB 9P connector (RS-422A interface) Remote control
⑨ REMOTE1-IN (9P)	D-SUB 9P connector (RS-422A interface) Remote control
⑨ CONTROL PANEL	D-SUB (mini) 29P connector for an outside control panel connection

Input connectors

① VIDEO INPUT, REF.VIDEO	BNC × 2 in loop through connection Outside reference video signal (Black burst or composite sync) 0.3 V p-p, 75 Ω, sync negative

< Rear panel >



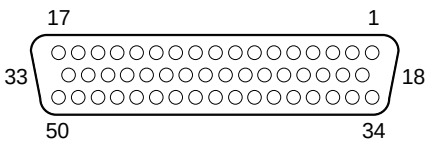
Note This figure is with optional kit.

Output connectors

② VIDEO OUTPUT, COMPOSITE	BNC × 3 (including 1 for character superimpose) Analog composite video 1.0 V p-p, 75 Ω, sync negative
② VIDEO OUTPUT, COMPONENT	BNC × 3 (1 set: Y, R-Y, and B-Y) Analog component video Y : 1.0 V p-p, 75 Ω, sync negative R-Y/B-Y : 0.7 V p-p, 75 Ω
③ SDI	BNC × 3 (including 1 for character superimpose) Serial digital interface (270 Mbit/s), complies with SMPTE 259M & ITU-R BT.656
④ AUDIO OUTPUT	XLR 3-pin × 4 (1 set: CH1, CH2, CH3, and CH4) Analog audio 4 channels +4 dBm (Standard) (600 Ω load), low impedance, balanced
⑤ TIME CODE OUT	XLR 3-pin × 1 Time code 2.2 V p-p, low impedance, balanced
⑥ MONITOR OUTPUT	XLR 3-pin × 2 (1set: L and R) Analog audio +4 dBm (Standard) (600 Ω load), low impedance, balanced
⑦ AUDIO OUTPUT (AES/EBU)	BNC × 2 (1set: CH1/2 and CH3/4) Digital audio 4 channels AES/EBU format, complies with AES-3id-1995
⑩ SDTI	BNC × 2 (optional kit BKNW-118 or BKNW-124) Serial data transport interface (270 Mbit/s) in conformity to MPEG2 4: 2: 2 P@ML BKNW-118: Complies with SMPTE 305M (SDTI (SX)) BKNW-124: Complies with SMPTE 305M + 326M (SDTI-CP)
PHONE (Upper control panel)	JM-60 stereo phone jack Analog audio up to −12 dBu (8 Ω load), unbalanced

PARALLEL I/O: 50-pin (female)

〈External view〉



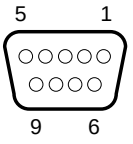
Pin No.	I/O *1	Setting change *2	Signal	Description
1	IN	○	FF	CLOSURE SW (FF)
2	OUT	×	REC SW	PANEL REC SW OUT
3	OUT	×	PLAY SW	PANEL PLAY SW OUT
4	OUT	×	STOP SW	PANEL STOP SW OUT
5	OUT	×	ENTRY SW	PANEL ENTRY SW OUT
6	OUT	×	REF SYSTEM ALARM	Non-REFERENCE
7	OUT	×	CF LOCK	COLOR FRAME LOCK STATUS
8	OUT	×	DRUM LOCK	LOCK STATUS OF DRUM SERVO
9	OUT	×	CAP LOCK	LOCK STATUS OF CAPSTAN SERVO
10	OUT	○	CUE PRESET	EDIT PRESET STATUS of the CUE Channel
11	OUT	○	TC PRESET	EDIT PRESET STATUS of the TC Channel
12	OUT	○	OXIDE/METAL	OXIDE/METAL TAPE STATUS
13	OUT	○	TAPE THICKNESS	TAPE THICKNESS STATUS
14	OUT	×	SPARE	SPARE
15	OUT	×	SPARE	SPARE
16	——	——	+12V	——
17	——	——	GND	SIGNAL GND
18	IN	○	PREROLL	CLOSURE SW (PREROLL)
19	IN	○	STBY ON	CLOSURE SW (STANDBY ON)
20	IN	○	REW	CLOSURE SW (REW)
21	IN	○	ENTRY	CLOSURE SW (ENTRY IN)
22	IN	○	STBY OFF	CLOSURE SW (STANDBY OFF)
23	IN	○	EJECT	CLOSURE SW (EJECT)
24	OUT	×	REC	REC STATUS
25	OUT	×	CH CONDITION RED	CHANNEL CONDITION RED STATUS
26	OUT	○	ASSEMBLE PRESET	ASSEMBLE PRESET STATUS
27	OUT	○	EDIT OUT	EDIT STATUS
28	OUT	○	EJECT OUT	EJECT STATUS
29	OUT	○	ANALOG/DIGITAL	ANALOG/DIGITAL STATUS
30	OUT	○	REEL HUB	REEL HUB STATUS
31	OUT	×	REM2 SETTING DATA RESET	REMOTE2 SETTING DATA RESET STATUS
32	OUT	×	ALL REC INHIBIT	ALL REC INHIBIT STATUS
33	——	——	GND	
34	IN	○	PLAY	CLOSURE SW (PLAY)
35	IN	○	STOP	CLOSURE SW (STOP)

Pin No.	I/O *1	Setting change *2	Signal	Description
36	IN	○	REC	CLOSURE SW (REC)
37	OUT	×	REV LAMP	REV LAMP STATUS
38	OUT	○	DA2 PRESET	DA2 EDIT PRESET STATUS
39	OUT	○	DA1 PRESET	DA1 EDIT PRESET STATUS
40	OUT	×	FWD LAMP	FWD LAMP STATUS
41	OUT	○	DA4 PRESET	DA4 EDIT PRESET STATUS
42	OUT	○	DA3 PRESET	DA3 EDIT PRESET STATUS
43	OUT	×	STOP	STOP STATUS
44	OUT	○	VIDEO PRESET	VIDEO EDIT PRESET STATUS
45	OUT	○	INSERT PRESET	INSERT EDIT PRESET STATUS
46	OUT	×	STBY ON	STANDBY ON STATUS
47	OUT	×	PLAY	PLAY STATUS
48	OUT	×	REMOTE	REMOTE STATUS
49	OUT	×	ALARM	SYSTEM ALARM STATUS
50	OUT	○	PREROLL	PREROLL STATUS

∗1: Input ; 47 kΩ pull up to +5 V (close/open)
Output ; 10 kΩ pull up to +5 V (0 V or open)
∗2: The pins described as ○ mark are possible to change the setting.
Refer to the optional interface manual for changing the setting.

REMOTE1-IN: 9-pin (female)
REMOTE1-OUT: 9-pin (female)

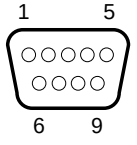
〈External view〉



Pin No.	Signal
1	GND
2	RM TX(–)
3	RM RX(+)
4	GND
5	PRIORITY
6	GND
7	RM TX(+)
8	RM RX(–)
9	GND

RS-232C: 9-pin (male)

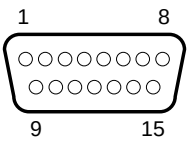
〈External view〉



Pin No.	Signal
1	DCD ; Data Carrier Detect (Input)
2	RXD ; Received Data (Input)
3	TXD ; Transmitted Data (Output)
4	DTR ; Data Terminal Ready (Output)
5	SG ; Signal Ground
6	DSR ; Data Set Ready (Input)
7	RTS ; Request to Send (Output)
8	CTS ; Clear to Send (Input)
9	NC

VIDEO CONTROL: 15-pin (male)

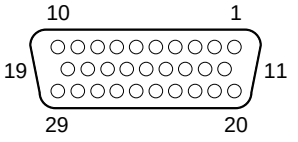
〈External view〉



Pin No.	Signal	Terminal voltage (V)
1	SYNC CONT (Input)	–5 to +5
2	HUE CONT (Input)	–5 to +5
3	SC CONT (Input)	–5 to +5
4	VIDEO LEVEL CONT (Input)	–5 to +5
5	SETUP CONT (Input)	–5 to +5
6	CHROMA LEVEL CONT (Input)	–5 to +5
7	REG –12V (Output)	–12
8	GND	——
9 to 12	NC	——
13	Y/C DELAY CONT (Input)	–5 to +5
14	NC	——
15	REG +12V (Output)	+12

CONTROL PANEL: 29-pin (female)

〈External view〉



Pin No.	Signal	Terminal voltage (V)
1	GND	——
2	KEY RX (–) (Input)	RS422
3	KEY TX (+) (Output)	RS422
4	GND	——
5 to 7	REG +8V (Output)	+8
8, 9	NC	——
10, 11	GND	——
12	KEY RX (+) (Input)	RS422
13	KEY TX (–) (Output)	RS422
14	GND	——
15 to 17	REG +8V (Output)	+8
18	NC	——
19 to 23	GND	——
24 to 26	REG +8V (Output)	+8
27, 28	NC	——
29	GND	——-

1-9. Switch Settings on Connector Panel

When the unit is installed, be sure to perform the following setup.
Refer to the operation manual “Section 2 Location and Function of Parts” for setup.

- 75 Ω termination switch of reference video input

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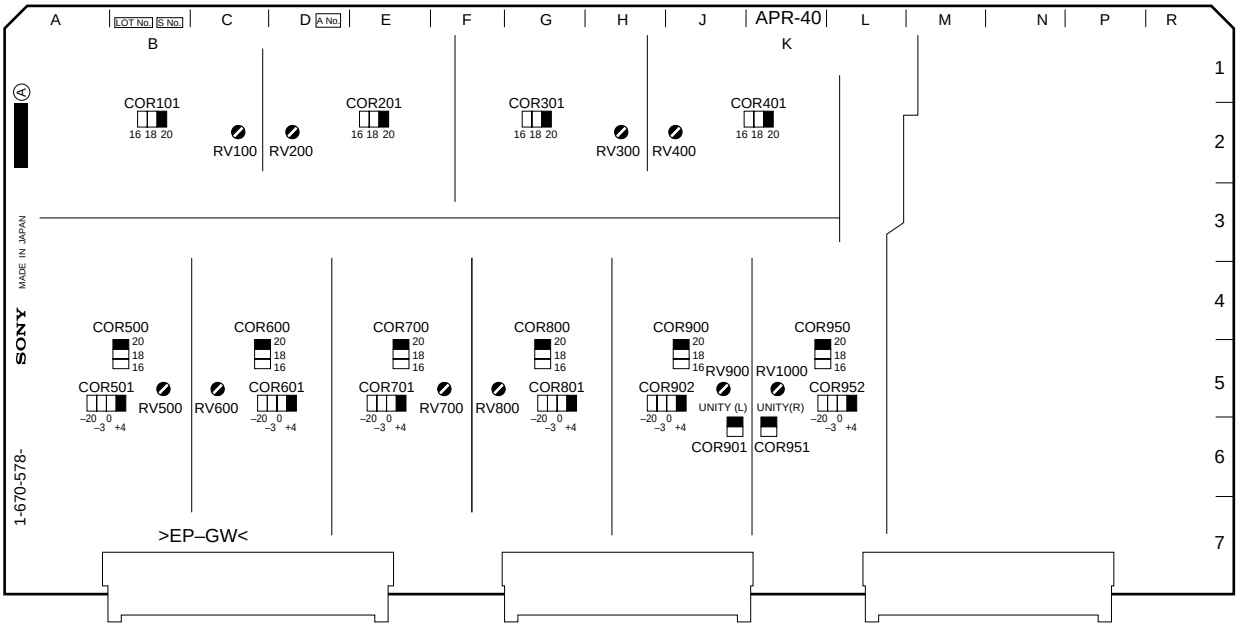
1-10. Switch and Shorting Plug Settings on PC Boards

1-10-1. APR-40C Board

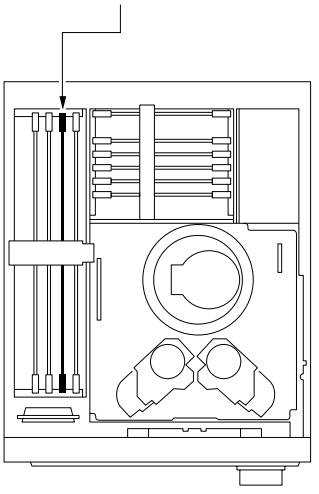
If necessary, perform the following audio-related settings using the shorting plugs on the APR-40C board.

- Audio input headroom *2 (For Betacam/Betacam SP audio playback)
- Audio output level *1
- Audio output headroom *2
- Monitor output level *1
- Monitor output headroom *2
- Monitor output level, fixed/variable selection

∗1: Select the level for each channel from +4, 0, −3, −20 dBm. (Factory settings: +4 dBm for each channel)
∗2: Select the headroom for each channel from 20, 18, 16, dB. (Factory settings: 20 dB for each channel)



APR-40C Board (Side A)



< Top View >

Note

Refer to Section 2-13 for removing/reattaching the plug-in boards.

Audio input headroom settings (For Betacam/Betacam SP audio playback)

Channel	Ref. No.	Display	Input headroom (dB) [ ]: Factory setting			Fine adjustment
			[20]	18	16	
CH1	COR101	20	Short	Open	Open	RV100
		18	Open	Short	Open	
		16	Open	Open	Short	
CH2	COR201	20	Short	Open	Open	RV200
		18	Open	Short	Open	
		16	Open	Open	Short	
CH3	COR301	20	Short	Open	Open	RV300
		18	Open	Short	Open	
		16	Open	Open	Short	
CH4	COR401	20	Short	Open	Open	RV400
		18	Open	Short	Open	
		16	Open	Open	Short	

Audio output level settings

Channel	Ref. No.	Display	Output level (dBm/600 Ω) [ ]: Factory setting				Fine adjustment
			[+4]	0	−3	−20	
CH1	COR501	+4	Short	Open	Open	Open	RV500
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	
CH2	COR601	+4	Short	Open	Open	Open	RV600
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	
CH3	COR701	+4	Short	Open	Open	Open	RV700
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	
CH4	COR801	+4	Short	Open	Open	Open	RV800
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	

Audio output headroom settings

Channel	Ref. No.	Display	Output headroom (dB) [ ]: Factory setting			Fine adjustment
			[20]	**18**	**16**	
CH1	COR500	20	Short	Open	Open	RV500
		18	Open	Short	Open	
		16	Open	Open	Short	
CH2	COR600	20	Short	Open	Open	RV600
		18	Open	Short	Open	
		16	Open	Open	Short	
CH3	COR700	20	Short	Open	Open	RV700
		18	Open	Short	Open	
		16	Open	Open	Short	
CH4	COR800	20	Short	Open	Open	RV800
		18	Open	Short	Open	
		16	Open	Open	Short	

Monitor output level settings

Channel	Ref. No.	Display	Output level (dBm/600 Ω) [ ]: Factory setting				Fine adjustment
			[+4]	**0**	**−3**	**−20**	
L	COR902	+4	Short	Open	Open	Open	RV900
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	
R	COR952	+4	Short	Open	Open	Open	RV1000
		0	Open	Short	Open	Open	
		−3	Open	Open	Short	Open	
		−20	Open	Open	Open	Short	

Monitor output headroom settings

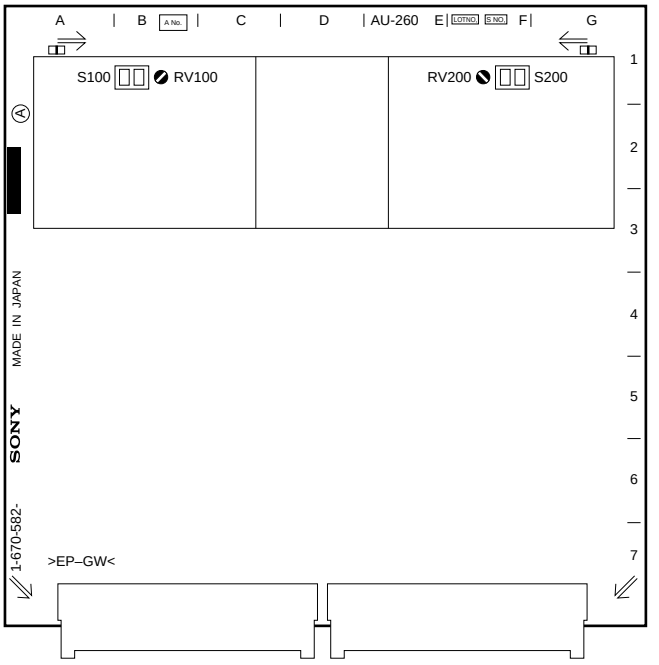
Channel	Ref. No.	Display	Output headroom (dB) [ ]: Factory setting			Fine adjustment
			[20]	18	16	
L	COR900	20	Short	Open	Open	RV900
		18	Open	Short	Open	
		16	Open	Open	Short	
R	COR950	20	Short	Open	Open	RV1000
		18	Open	Short	Open	
		16	Open	Open	Short	

Monitor output level switching (fixed or variable)

When the variable level is selected, the level is adjusted with the PHONE level control knob.

Channel	Ref. No.	Display	Monitor output level [ ]: Factory setting	
			[Fixed]	Variable
L	COR901	UNITY(L)	Short	Open
		VAR(L)	Open	Short
R	COR951	UNITY(R)	Short	Open
		VAR(R)	Open	Short

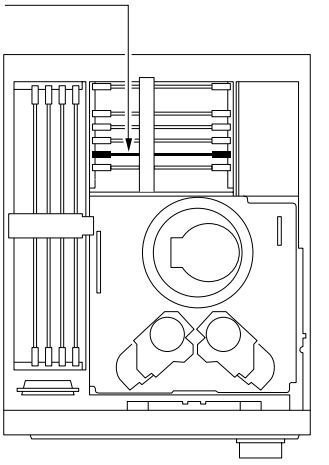
1-10-2. AU-260 Board



AU-260 Board (Side A)

Note

Refer to Section 2-13 for removing/reattaching the plug-in board.



< Top View >

HEAD TUNE switches (For Betacam/Betacam SP longitudial audio playback)

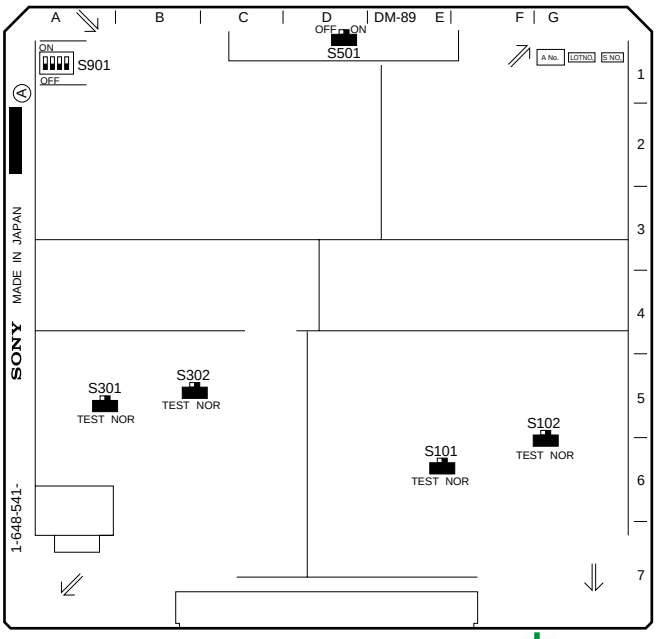
It is not necessary to change the setting of this switch, when installing.

Channel	Ref. No.	Description
CH1	S100	By coupling with RV100, adjust the CH1 head amp high frequency response. This switch is used in audio head dumping adjustment. When the unit is shipped, this switch is set to the position based on the adjustment condition.
CH2	S200	By coupling with RV200, adjust the CH2 head amp high frequency response. This switch is used in audio head dumping adjustment. When the unit is shipped, this switch is set to the position based on the adjustment condition.

1-10-3. DM-89 Board

Note

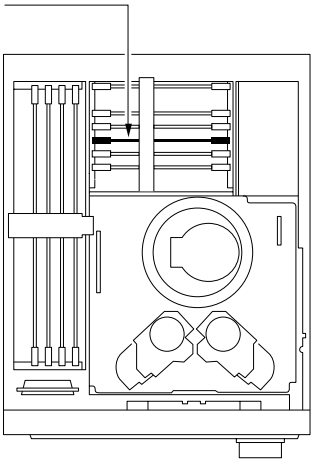
Never change the settings of the factory use switches.



DM-89 Board (Side A)

Note

Refer to Section 2-13 for removing/reattaching the plug-in board.



< Top View >

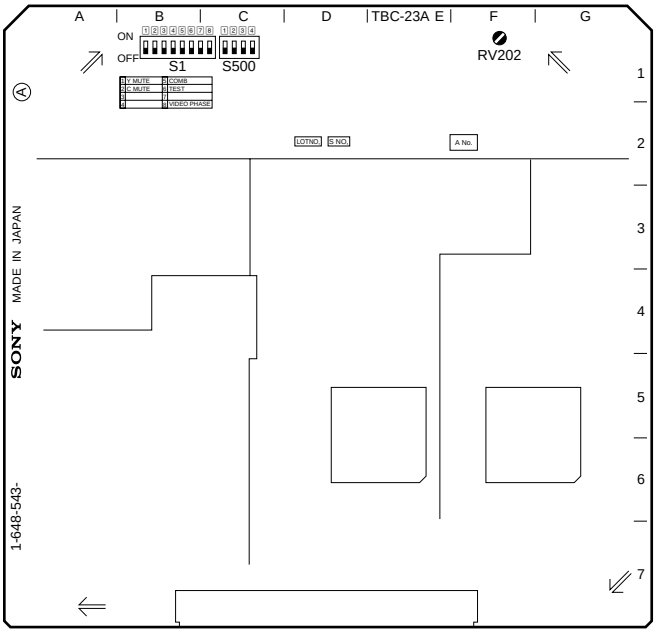
Switches

Ref. No.	Bit	Name	Description	Factory setting
S101		Y-RF LPF & EQ TEST (Y-RF low-pass filter & equalizer test)	The Y-RF low-pass filter & equalizer test signal connection switch To adjust: Select the TEST position. Connect the input signal to TP103. (GND to E102)	NORMAL POSITION
S102		————	Factory use	NORMAL POSITION
S301		C-RF LPF & EQ TEST (C-RF low-pass filter & equalizer test)	The C-RF low-pass filter & equalizer test signal connection switch To adjust: Select the TEST position. Connect the input signal to TP303. (GND to E302)	NORMAL POSITION
S302		————	Factory use	NORMAL POSITION
S501		————	Factory use	ON
S901	1	RF ADJUSTING	Selection whether to adjust the RF or not. OFF (OPEN) : Normal mode ON (CLOSE) : Test (adjustment) mode	OFF (OPEN)
	2 | 4	————	Factory use	OFF (OPEN)

1-10-4. TBC-23A Board

Note

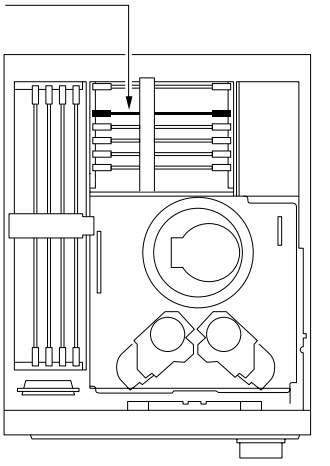
Never change the settings of the factory use switches.



TBC-23A Board (Side A)

Note

Refer to Section 2-13 for removing/reattaching the plug-in board.



< Top View >

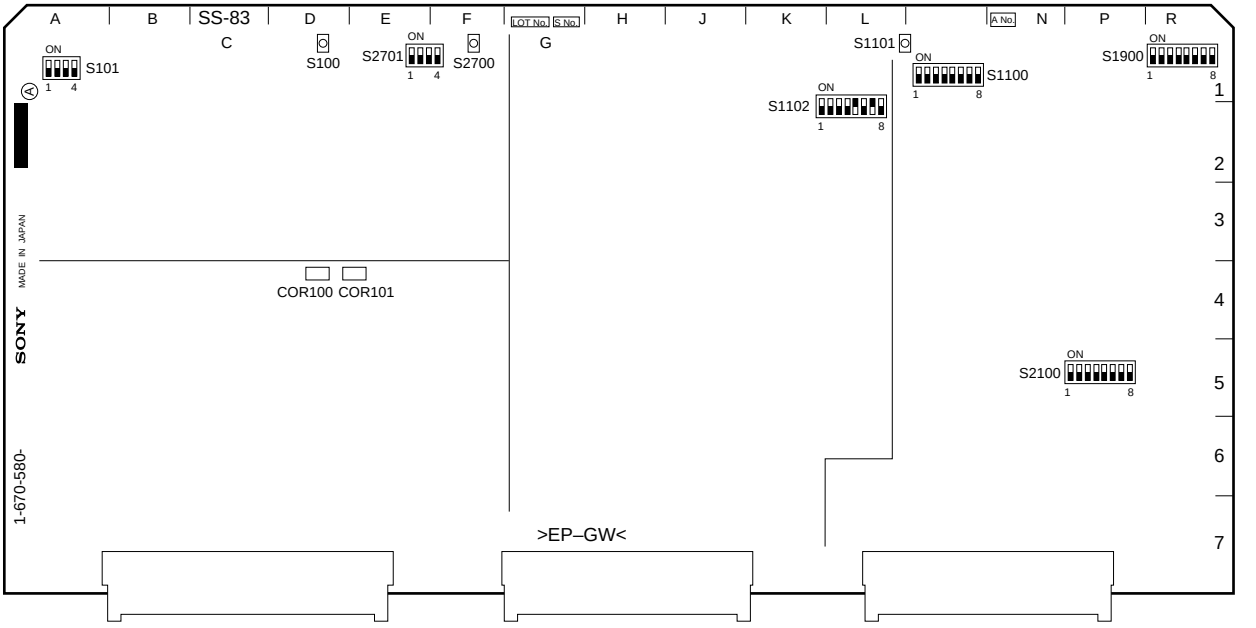
Switches

Ref. No.	Bit	Name	Description	Factory setting
S1	1	Y MUTE	OFF (OPEN) : Normal mode ON (CLOSE) : Muting luminance signal	OFF (OPEN)
	2	C MUTE	OFF (OPEN) : Normal mode ON (CLOSE) : Muting color difference signal	OFF (OPEN)
	3	————	Factory use	OFF (OPEN)
	4	————	Factory use	OFF (OPEN)
	5	COMB	Selection whether to select a comb filter when the color difference signal has significant line crawl which cannot be corrected by LCC or not. OFF (OPEN) : Comb filter OFF ON (CLOSE) : Comb filter ON	OFF (OPEN)
	6	TBC TEST	Selection whether to enable the TBC-23A and -24 boards self diagnostics or not. OFF (OPEN) : Normal mode ON (CLOSE) : Test (self diagnostics) mode	OFF (OPEN)
	7	————	Factory use	OFF (OPEN)
	8	VIDEO PHASE	Selection whether to use VIDEO PHASE VR or not. OFF (OPEN) : VIDEO PHASE VR (RV202) disabled ON (CLOSE) : VIDEO PHASE VR (RV202) enabled	OFF (OPEN)
S500	1 | 4	————	Factory use	OFF (OPEN)

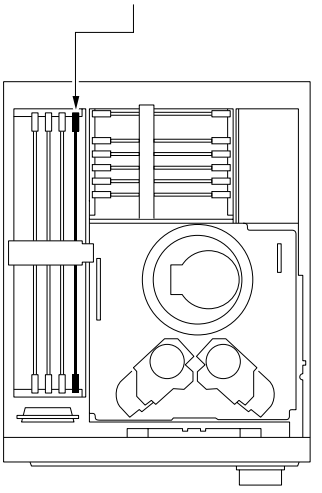
1-10-5. SS-83 Board

Notes

- Never change the settings of the factory use switches/shorting plugs.
- This figure is for DNW-A65.



SS-83 Board (Side A)



< Top View >

Note

Refer to 2-13 for removing/ reattaching the plug-in board.

Shorting plugs

Ref. No.	Name	Description	Factory setting
COR 100	————	Factory use	OPEN
COR 101	————	Factory use	OPEN

Switches

Ref. No.	Bit	Name	Description	Factory setting
S100		REEL POSITION	Press this switch when changing the reel position. This switch does not operate in the state of installing the cassette compertment.	————
S101	1	FLASH MEMORY	**Note** Do not change the setting of this switch during installation. Select the operation mode of flash memory. OFF (OPEN) : Normal mode ON (CLOSE) : Writing mode	OFF (OPEN)
	2	ANA AUTO-TRACKING	Select whether to enable auto tracking operation or not during playing back the tape recorded based on the Betacam/Betacam SP format. OFF (OPEN) : Not operate (The tracking is controlled using RV100.) ON (CLOSE) : Operates **Note** The BetacÅam SX tape playback is carried out by non-tracking operation.	OFF (OPEN)
	3	ANA DISABLE	Select whether to prohibit analog Betacam tape playback or not. OFF (OPEN) : Enable ON (CLOSE) : Disable	OFF (OPEN)
	4	SV ERR DISABLE	**Note** Do not change the setting of this switch during installation. This switch selects whether to disable the detection of a malfunctional error in a servo circuit. OFF (OPEN) : Enable (normal) ON (CLOSE) : Disable	OFF (OPEN)
S1100	1	EXTENDED MENU	OFF (OPEN) : Not display the extended menu of the setup menu ON (CLOSE) : Displays the extended menu of the setup menu	OFF (OPEN)
	2	MAINTE MODE ACCESS	OFF (OPEN) : Not enter into the maintenance mode from the lower control panel ON (CLOSE) : Enters into the maintenance mode from the lower control panel	OFF (OPEN)
	3	————	Factory use	OFF (OPEN)
	4	RS232C DEBUG	OFF (OPEN) : RS-232C connector is for ISR ON (CLOSE) : RS-232C connector is for debug	OFF (OPEN)
	5-8	————	Factory use	OFF (OPEN)
S1101		MAINTE MODE START	Press this switch when starting the maintenance mode.	————
S1102		**Note** Never change the settings of the S1102 switch since each switch is set according to the characteristics of the unit. But set this switch according to each unit when replacing the board.		
	1, 2	————	Factory use	OFF (OPEN)
	3-6	Model ID	DNW-A65/A65P / TTV 4065 N/P 3: OFF / ON 4: OFF / OFF 5: ON / ON 6: OFF / OFF	⇦
	7	J/UC	Settable when pin No.8 is OFF. OFF (OPEN) : Japan model ON (CLOSE) : Except Japan model	ON (CLOSE)
	8	525/625	OFF (OPEN) : 525/60 model ON (CLOSE) : 625/50 model	DNW-A65/TTV 4065N: OFF (OPEN) DNW-A65P/TTV 4065P: ON (CLOSE)
S1900	1-8	————	Factory use	OFF (OPEN)
S2100	1-8	————	Factory use	OFF (OPEN)
S2700		DE-DISTORTION	Press this switch when distorting	————
S2701	1	————	Factory use	OFF (OPEN)
	2	DT MODE	OFF (OPEN): DT ON ON (CLOSE): DT OFF	OFF (OPEN)
	3-8	————	Factory use	OFF (OPEN)

1-11. Switching Search Dial Mode

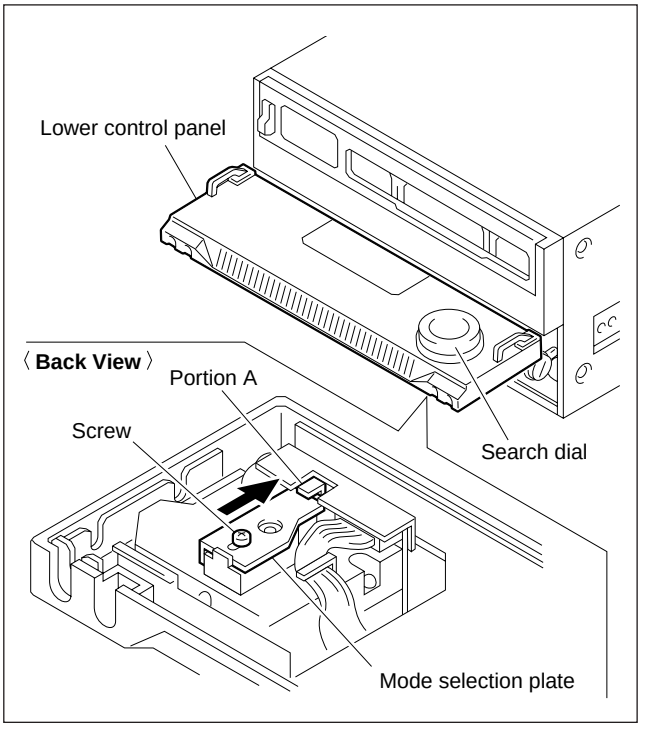
There are two kinds of operation to switch the search dial on the lower control panel between jog mode and shuttle mode.

- **SHUTTLE/JOG button selecting**
  To enter the shuttle mode, press the SHUTTLE button.
  To enter the jog mode, press the JOG button.

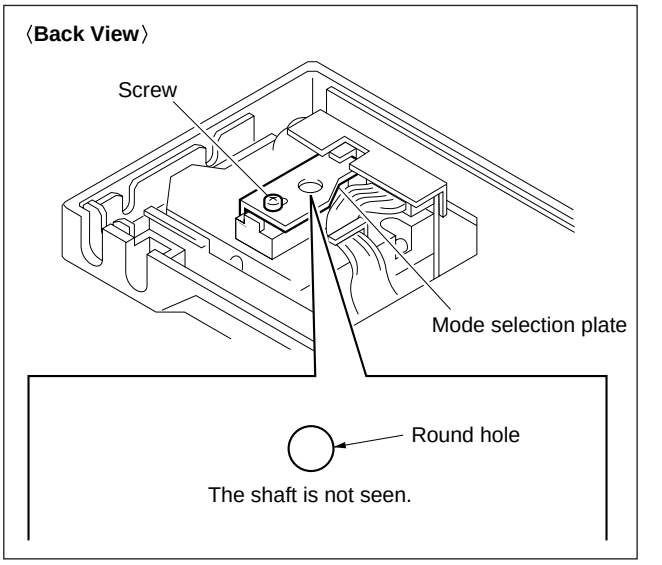
- **Search dial pressing**
  When you press the dial, this unit toggles between shuttle and jog modes.
  It is possible to prohibit a manner of toggling.

Prohibiting Search Dial Pressing

1. Open the lower control panel (as shown in the figure.)
2. Loosen a screw on the backside of the search dial as shown in the figure.
3. Slide the mode selection plate in the direction indicated by the arrow until it contacts the portion A.

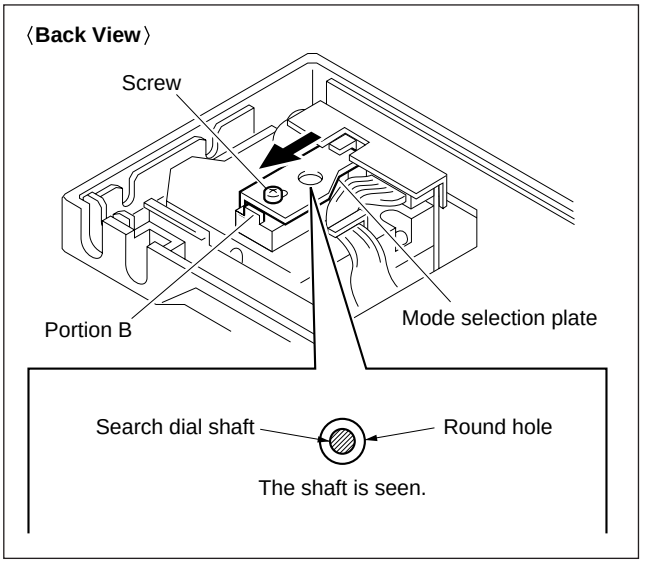


4. Check to see that the shaft of the search dial is not seen in the round hole of the mode selection plate, and then tighten the screw.



Allowing Search Dial Pressing

1. Open the lower control panel (Operation side up).
2. Loosen a screw on the backside of the search dial as shown in the figure.
3. Slide the mode selection plate in the direction indicated by the arrow until it contacts the portion B.
4. Check to see that the shaft of the search dial is seen in the round hole of the mode selection plate, and then tighten the screw.



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1-12. Reference System

The external reference video signal is used as the reference signal for this unit.
However, if the external reference video signal is not input, the reference signal is automatically switched to the internal reference signal generated in the inside of this unit.

Alarm Display for Reference Signal

Blink of the STOP button

The button blinks when the reference video signal is not input to REF. VIDEO connector.
(This function can be canceled in setup menu ITEM-105.)

1-13. Settings and Adjustment when Peripheral Equipment is Connected

1-13-1. VTR Constant Values Setting of Editor

Set the VTR constant values following the table below when the editor which needs the setting of VTR constant values is connected. Moreover, the change of VTR constant values are required when the 525/625 system is switched by setup menu of this unit.

Model name	525/625	VTR CONSTANT 1								VTR CONSTANT 2							
		Data No.								Data No.							
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
DNW-A65	525/60	B0	47	00	96	07	07	03	8A*	0A	07	FB	00	81	3D	FF	5A
DNW-A65P	625/50	B1	47	00	7D	07	07	03	8A*	0A	06	FB	00	83	4B	FF	4B

*: Set the data of No.8 of the VTR CONSTANT 1 to “0A” for the following editors.
- BVE-900 ROM versions earlier than 1.08
- BVE-600 ROM versions earlier than 1.01

Note

When remote-controlling this unit by the editor, set the setup menu ITEM-401: FUNCTION MODE AFTER CUE-UP to “STOP”.

1-13-2. System Phase Alignment

An external reference video signal and analog composite signal must be input to this unit after they are adjusted so that SC-H conforms to the specifications.

When Connecting to a Digital Switcher

Fundamentally, the system phase adjustment is not necessary.
Refer to the manual of digital switcher for details.

When Connecting to an Analog Switcher

Perform the system phase adjustment according to the manual of the analog switcher.

To adjust the system phase of this unit, use the SYNC and SC control knobs of SYSTEM PHASE on the sub control panel.

Notes

- Be sure to adjust in PB mode.
- The playback sound may be momentarily interrupted when the SYNC/SC control knob is turned during tape playback.

1-13-3. Setup Menu Settings

Analog Component Output Format Setting “ITEM-709” (525/60 system only)

Set the output (SUB-ITEM-1) side to “D-1” or “B-CAM” according to the operating system, respectively.

Section 2
Service Overview

2-1. Notes on Power Supply Block

2-1-1. Warning on Primary Circuit Block and Electric Shock

WARNING

The primary circuit consists of the AC-169 board with AC inlet, the circuit breaker, the POWER switch, and the power supply unit.
Be careful not to receive an electric shock when performing the maintenance and service works with the power turned on.
A primary voltage remains applied to the AC-169 board, circuit breaker, and POWER switch even if the POWER switch is turned off. For the work that requires no current conduction, therefore, turn off the POWER switch and disconnect the power cord.

2-1-2. Note on Resetting the Circuit Breaker

The circuit breaker of a primary circuit is mounted on the power panel of this unit. When an overcurrent flows in the primary circuit, the breaker operates and the button protrudes.
If the breaker operates, eliminate the cause for which an overcurrent flows, then push the button.

2-2. Cleaning when the Heads are Clogged

Clean using a cleaning cassette tape (specified product: BCT-5CLN) when the video heads are clogged.
For the cleaning, refer to “5-2-1. Cleaning using Cleaning Tape”.

WARNING

Clean the video heads in the prescribed procedure using a specified cleaning cassette tape. If not, the video heads may be abrasive or damaged.

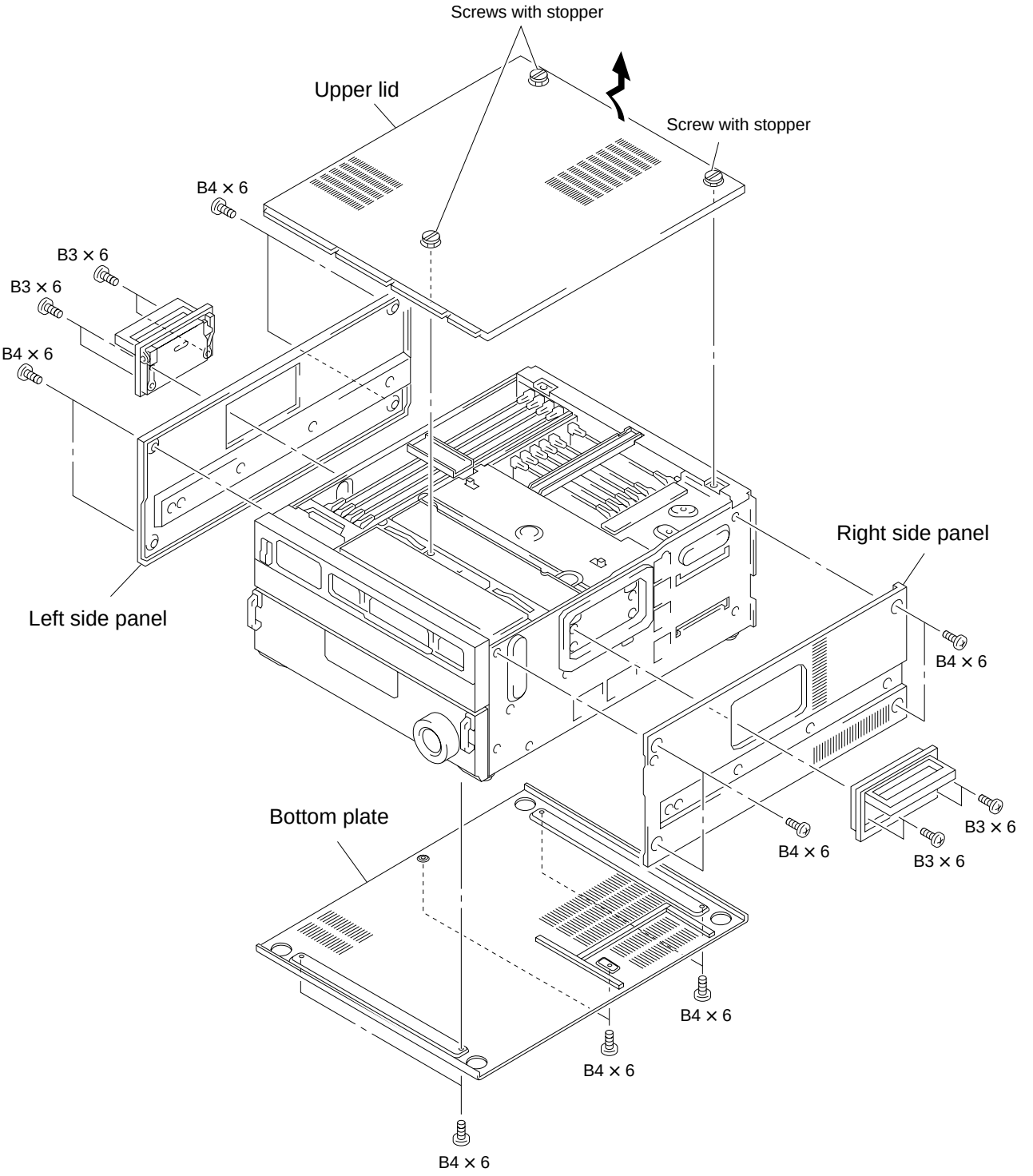
If the head clogging is not solved using a cleaning cassette tape, use cleaning cloth.
For the cleaning using a cleaning cloth, clean according to the procedure of “5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning” after confirming the cautions and preparation in “5-2-2. General Information for Cleaning using Cleaning Cloth”.

2-3. Removing/Reattaching Cabinet

2-3-1. Upper Lid, Side Panels, and Bottom Plate

Note

Turn off the power and unplug the power cord before removing/reattaching.



Upper Lid

1. Loosen the three fixing screws.
2. Remove the upper lid by moving in the direction indicated by the arrow.

When reattaching, install in the reverse order of removal.

Side Panels

(The right and left side panels are the same in procedure.)

1. Remove the four screws (B3 × 6), and remove the handle.
2. Remove the four screws (B4 × 6), and remove the side panel.

When reattaching, install in the reverse order of removal.

Bottom Plate

Note

With the handle attached, place the unit on its right side panel down for removal and installation. Lend your hand so that the lower handle does not hang down.

1. Remove the six screws (B4 × 6), and remove the bottom plate.

When reattaching, install in the reverse order of removal.

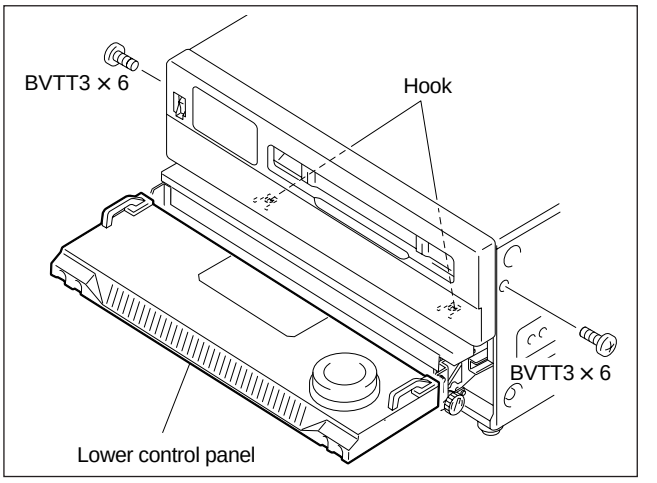
2-3-2. Control Panels

Note

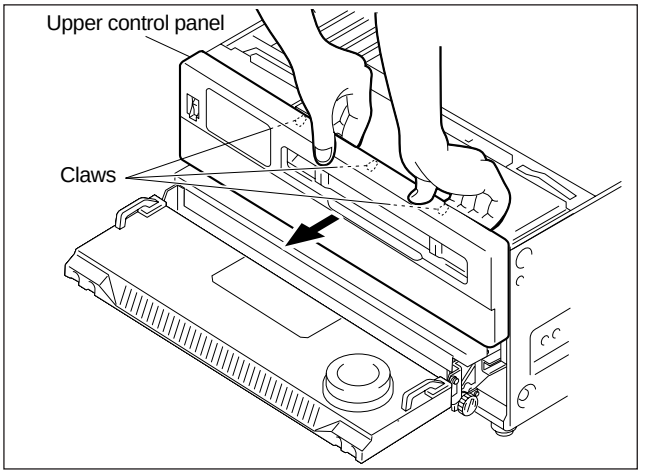
Turn off the power and unplug the power cord before removing/reattaching.

Upper Control Panel

1. Remove the upper lid. (Refer to Section 2-3-1.)
2. Remove the one screw each on the left and right sides.
3. Pull the lower control panel forward, then turn it upward. (Operation side up)
4. Unhook the two hooks at lower portion on the upper control panel.



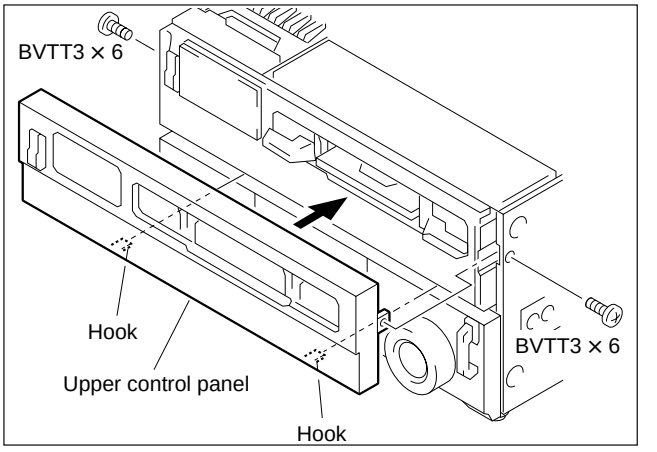
5. Unhook the claws at the upper control panel from the chassis, and remove in the direction of the arrow.



When reattaching, install in the reverse order of removal.

Note

Insert the hooks at the back of the panel into the convex portions of the chassis, then install the panel in the chassis. (Refer to the figure below.)



Note

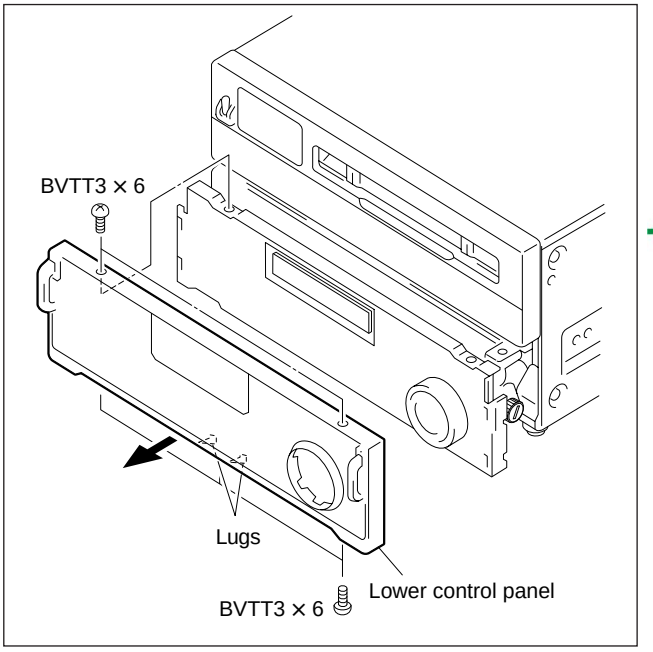
Turn off the power and unplug the power cord before removing/reattaching.

Lower Control Panel

1. Slightly pull the lower control panel forward, then pull it more strongly.
2. Remove the five screws on the top and bottom of the lower control panel.

   Note

   Open the lower control panel to facilitate removing the screws at the bottom of the panel.
3. Remove the two lugs at the back of the lower control panel.
4. Remove the lower control panel in the direction of the arrow.



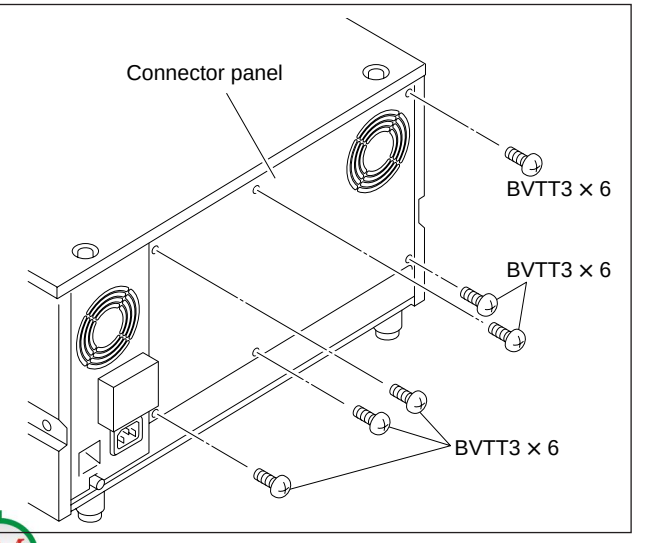
When reattaching, install in the reverse order of removal.

2-3-3. Connector Panel Assembly

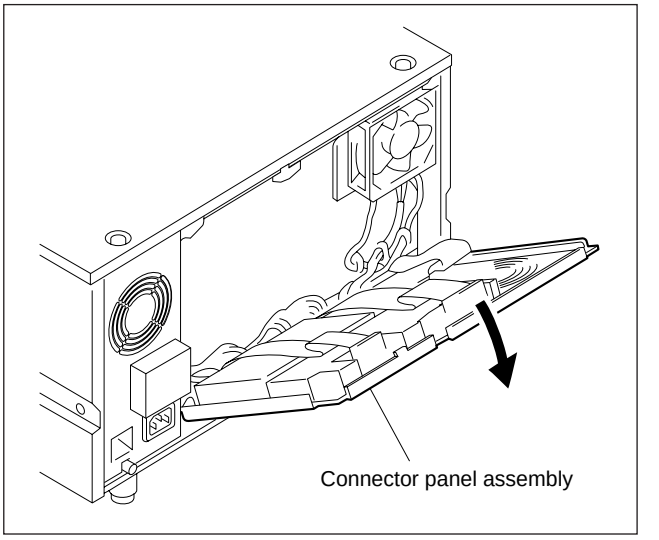
CAUTION

For your safety, turn off the power and unplug the power cord before removing/reattaching.

1. Remove the six screws indicated ⇒ on the connector panel.



2. Being careful not to stretch the harnesses, remove the connector panel assembly as shown in the figure.



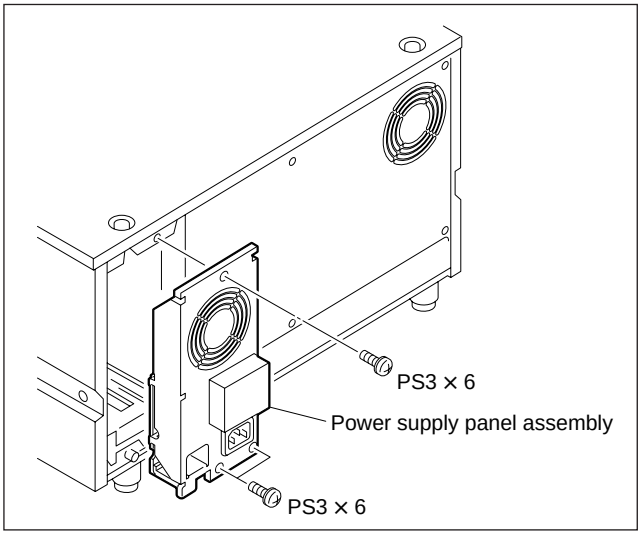
When reattaching, install in the reverse order of removal.

2-3-4. Power Supply Panel Assembly

CAUTION

For your safety, turn off the power and unplug the power cord before removing/reattaching.

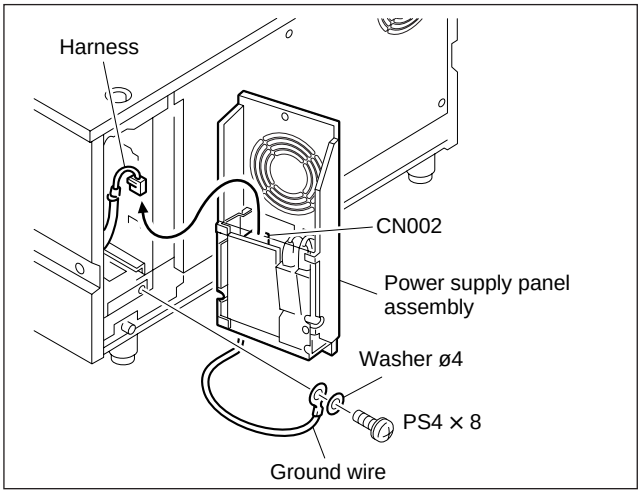
1. Remove the three screws, then pull the power supply panel assembly out.



2. Disconnect the harness from the connector (CN002) on the AC-169 board.
3. Remove the one screw fixing the ground wire to the chassis, then remove the power supply panel assembly.

Note

Be sure to remove the washer.



When reattaching, install in the reverse order of removal.

Note

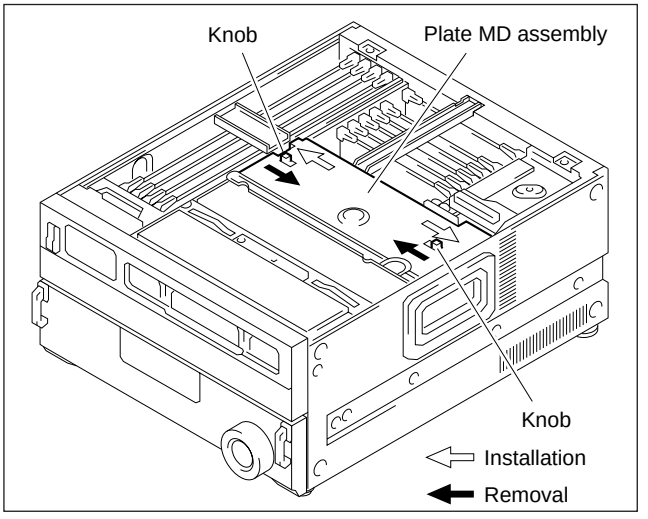
To fix the ground wire, put the washer between the terminal of ground wire and screw.

2-4. Removing/Reattaching Plate MD Assembly

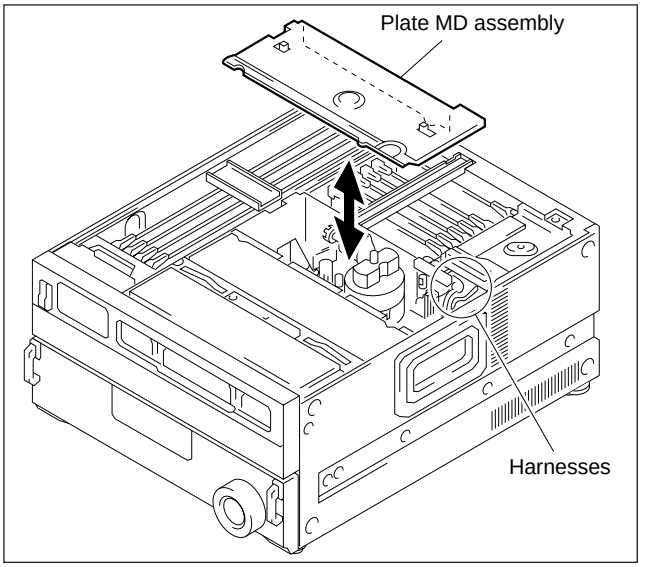
Note

Turn off the power and unplug the power cord before removing/reattaching.

1. Remove the upper lid.
   (Refer to "2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation".)
2. Slide the knobs on the plate MD assembly each in the inside. (Move the knobs to the outside to fix the plate MD assembly.)



3. Remove the plate MD assembly.



When reattaching, install in the reverse order of removal.

Note

Be careful not to pinch the harnesses under the plate MD assembly in reattaching.

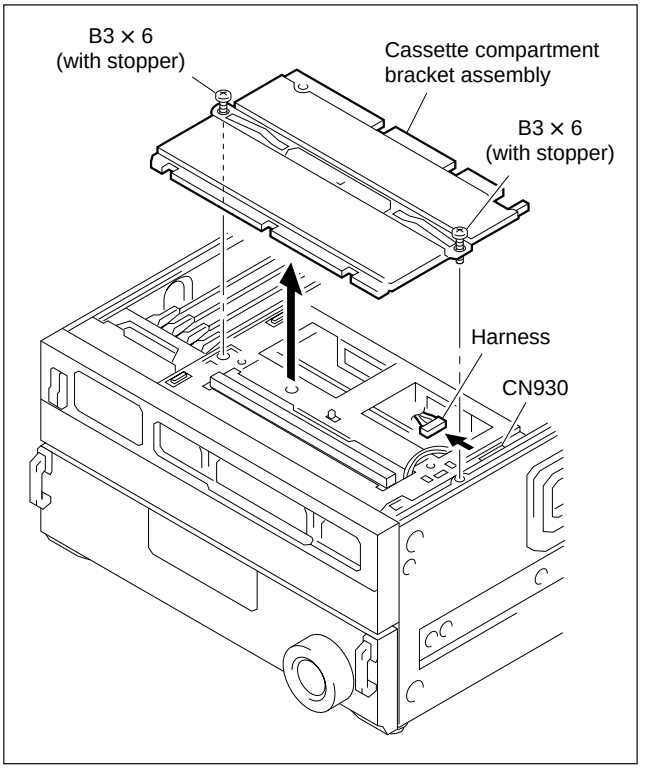
2-5. Removing/Reattaching Cassette Compartment

Notes

- Turn off the power and unplug the power cord before starting the removal/installation.
- The cassette compartment cannot be removed with the cassette tape inserted. Press the EJECT button with the power turned on to eject the cassette tape.
  If the cassette compartment does not move due to an electric trouble, take out the cassette tape manually. (Refer to "2-12. Taking Out the Cassette in Tape Slacking".)

Removal

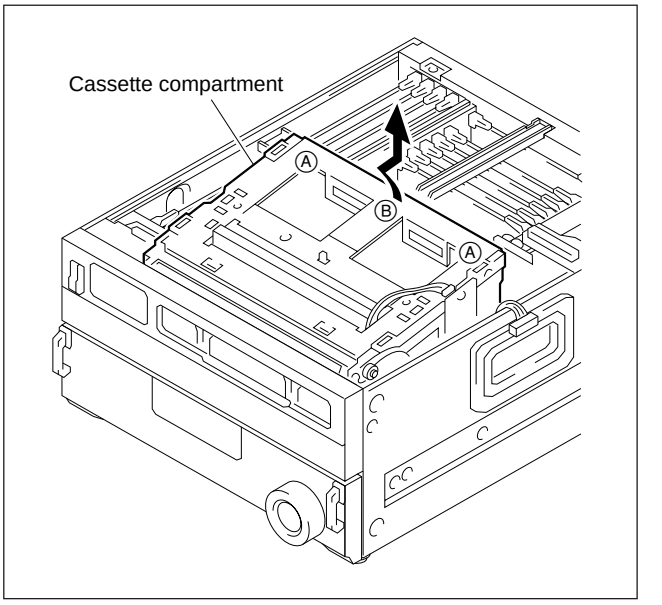
1. Remove the upper lid. (Refer to Section 2-3-1.)
2. Remove the plate MD assembly. (Refer to Section 2-4.)
3. Loosen the two screws, then remove the cassette compartment bracket assembly.
4. Disconnect the harness from the connector (CN930) on the CL-29 board. Keep the harness out of the way of the removal.



5. Hold the cassette compartment at the portions Ⓐ and lift up the cassette compartment slightly (by 1 cm). When the four cassette compartment positioning legs come off from the four positioning holes on a mechanical deck, shift the cassette compartment backward (by 1 cm) to the position where the cassette lid can be completely seen when viewed from just above.
6. Hold the cassette compartment at the portions Ⓑ, then slowly raise the cassette compartment upward to remove it.

Notes

- Being careful not to contact the gear on the right of the cassette compartment with the chassis, slowly raise the cassette compartment while slightly sliding it back-and-forth.
- Never move the cassette compartment to the right and left. If unnecessary force is applied to right and left, the gear or part may come off.
- Place the cassette compartment with the cassette lid up or with cassette compartment positioning legs down.
  (If it is put with the cassette lid down, the flexible card wire/board might be damaged.)



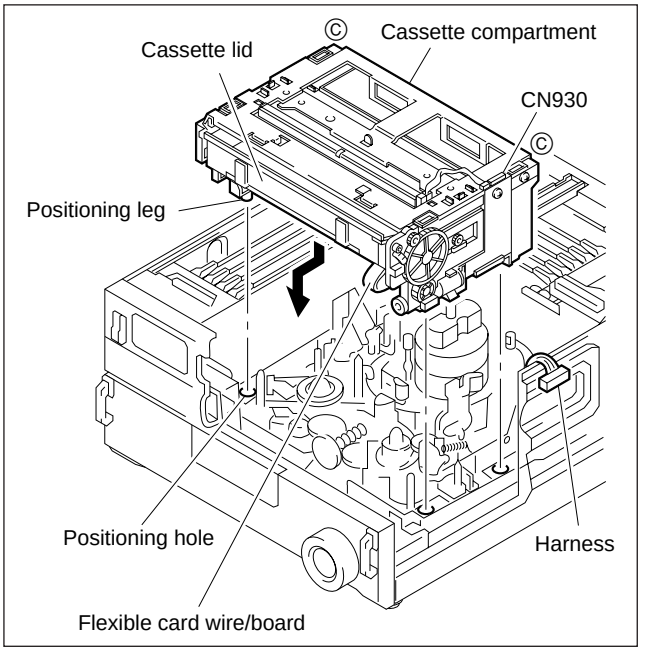
Installation

7. Place the cassette compartment into the unit in the direction as shown in the figure (with the cassette lid down).

Notes

- Being careful not to contact the gear on the right of the cassette compartment with the chassis, slowly insert the cassette compartment into the unit while slightly sliding it back-and-forth.
- Never move the cassette compartment to the right and left. If unnecessary force is applied to the right and left, the gear or part may come off.

8. Press the portions Ⓒ of the cassette compatment as shown in the figure, and then fit the four positioning legs into the four positioning holes in the mechanical deck.



9. Connect the harness to the connector (CN930) on the CL-29 board.
10. Reattach the cassette compartment bracket assembly.
11. Reattach the plate MD assembly and the upper lid.

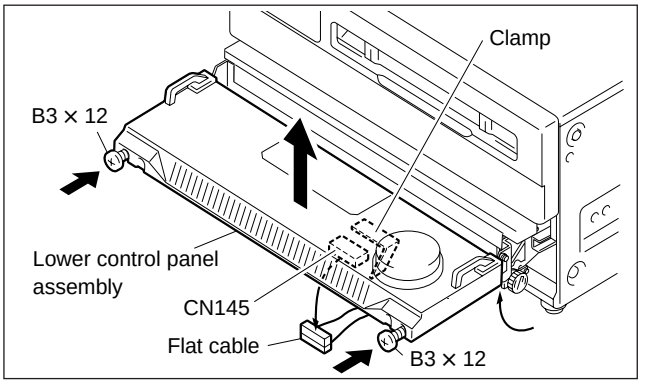
2-6. Removing/Reattaching Lower Control Panel Assembly

Note

Turn off the power and unplug the power cord before removing/reattaching.

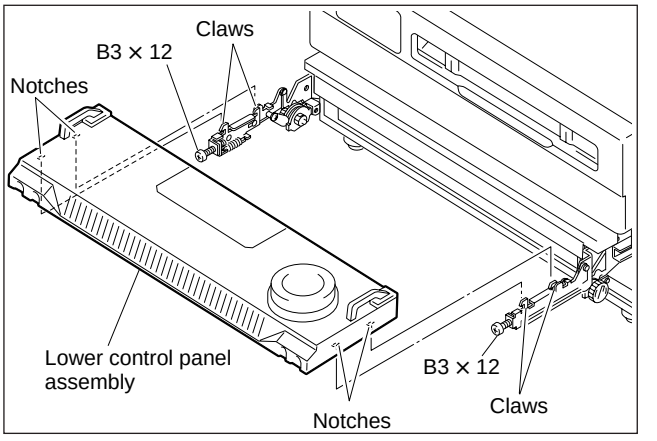
Removal

1. Pull the lower control panel forward, then turn it upward. (Operation side up)
2. Untie the flat cable from the clamp, then disconnect the flat cable from the connector (CN145) on the back of the lower control panel.
3. Loosen the two screws in bottom corners of the lower control panel assembly until screw's top are exposed from the lack of the panel assembly.
4. Push the loosened screws in the direction indicated by the arrow and raise the lower control panel assembly.



Installation

5. Set the notches of the panel assembly to the claws of the arms and insert the panel assembly until making a click sound.
6. Fix the lower control panel assembly with two screws.



7. Connect the flat cable to the connector (CN145), then tie the cable with the clamp.
8. Return the lower control panel to 0°, then store.

2-7. Circuit Function

System configuration	No.	Board name	Circuit function
Digital process	①	*1 DPR-118	Digital data processor (Audio/Video processor)
	②	SDI-41C	4:2:2 component serial digital interface with Embedded audio
Video process	③	*1 VPR-47	Video signal processor (D-A, Reference clock generator, Composite encoder)
Analog BETACAM video PB process	④	*1 DM-89	RF demodulator for Analog Betacam PB
	⑤	*1 TBC-24	TBC (A-D, Write clock generator)
	⑥	*1 TBC-23A	TBC (Sequence and Reference)
Audio process	⑦	*1 AU-260	Analog Betacam audio (LAU) PB circuit
	⑧	APR-40C	Audio signal processor, AES/EBU output interface
RF process	⑨	EQ-75C	RF equalizer (PB EQ, Analog BETACAM PB buffer, Inner error correction)
System/servo control	⑩	SS-83	System control, Servo control, DT control
	⑪	MS-58	Solenoids driver (Pinch, Brakes, Cleaning), Sensors input, Demagnetization head driver
	⑫	*1 DR-315	Motors driver (Drum, Capstan, Reels, Threading, Reel shift, Cassette up/down)
	⑬	*1 TC-102	TC PB circuit, Shot-mark REC circuit, TC erase OSC
	⑭	DT-34D	DT driver
Mech. deck driver/sensor	⑮	SE-461	Connection board with Condensation sensor
	⑯	PTC-54	Threading FG
	⑰	CCM-15	Threading motor
	⑱	CCM-15	Reel shift motor
	⑲	PD-35	Pinch solenoid connection, Tape end sensor connection
	⑳	TR-79	T tension sensor, Threading-end and Unthreading-end sensors
	㉑	PTC-59	Cassette's holes sensor
	㉒	RM-181	T reel motor
	㉓	SE-344	T reel FG
	㉔	RM-181	S reel motor
	㉕	SE-344	S reel FG
	㉖	PTC-71	Reel position sensors
	㉗	TR-78	S tension sensor

*1: The full name of each mounted board is as follows :

Model name	DPR-118	VPR-47	DM-89	TBC-24	TBC-23A	AU-260	DR-315	TC-102
DNW-A65	DPR-118C	VPR-47	DM-89	TBC-24	TBC-23A	AU-260	DR-315K	TC-102C
DNW-A65P	DPR-118C	VPR-47P	DM-89P	TBC-24P	TBC-23AP	AU-260P	DR-315K	TC-102C

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System configuration	No.	Board name	Circuit function
Cassette compartment	㉘	CL-29	Cassette up/down motor, Cassette down sensors
	㉙	LP-81	Lamp of cassette compartment
	㉚	PC-70	Cassette-in sensors, Cassette size sensor
Front panel	㉛	FP-117	Panel function (Switches, LEDs) control, CAV control level conversion
	㉜	※2 VR-223	Phone level VR, Phone connector
	㉝	※2 VR-224	Audio PB level VRs
	㉞	※2 SWC-35	Upper control panel function (Switches, LEDs)
	㉟	※2 SWC-31	Sub control panel function
	㊱	※2 KY-438	Lower control panel function
	㊲	PTC-69	Search dial sensor, Dial solenoid connection
Motherboard, connector panel	㊳	※2 MB-818	Motherboard, Remote control connectors (REMOTE1 (9P), RS-232C, VIDEO CONTROL, CONTROL PANEL)
	㊴	※2 CP-334	Connector board (Analog video) with output buffer
	㊵	※2 CP-278	Connector board (Analog audio output)
	㊶	※2 CP-335	Connector board (AES/EBU output)
	㊷	※2 CP-301	Connector board (TC output, MONITOR output)
	㊸	RM-130	Parallel (50-pin) remote interface, Remote control connector [REMOTE 2 PARALLEL (50P)]
	㊹	RM-179	NV-RAM for Parallel (50-pin) remote interface
Power	㊺	※2 AC-169	AC connector board with Breaker
	㊻	PS unit	Switching regulator (PS=Power supply)
Option	㊼	DPR-119	SDTI (SX) output interface (optional kit BKNW-118)
	㊽	DPR-150	SDTI-CP output interface (optional kit BKNW-124)

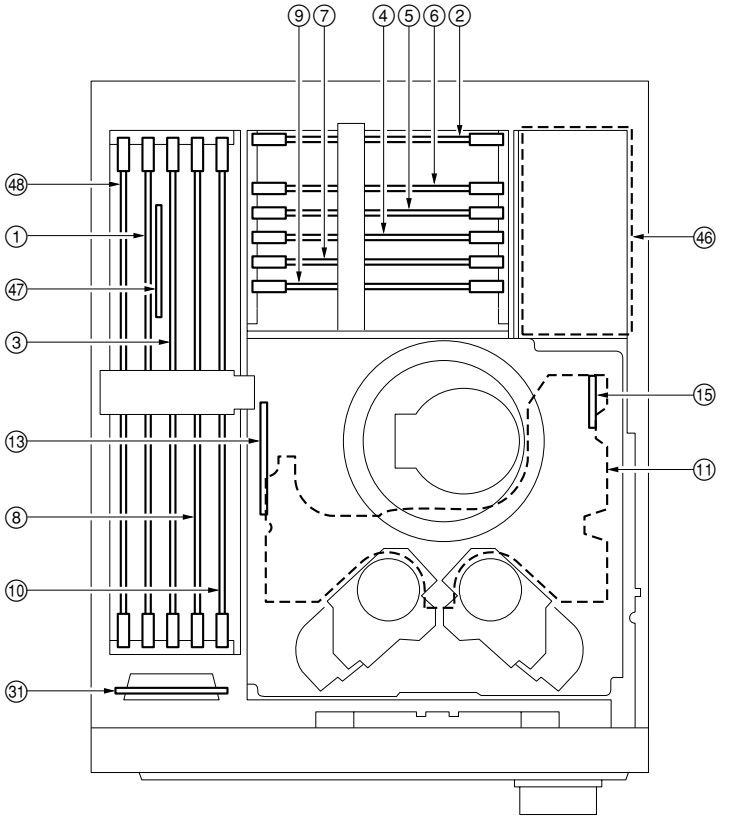
※2: The full name of each mounted board is as follows :

Model name	VR-223	VR-224	SWC-35	SWC-31	KY-438	MB-818	CP-334	CP-278	CP-335	CP-301	AC-169
DNW-A65	VR-223L	VR-224K	SWC-35C	SWC-31L	KY-438C	MB-818C	CP-334C	CP-278L	CP-335C	CP-301L	AC-169K
DNW-A65P	VR-223L	VR-224K	SWC-35C	SWC-31L	KY-438C	MB-818C	CP-334C	CP-278L	CP-335C	CP-301LP	AC-169K

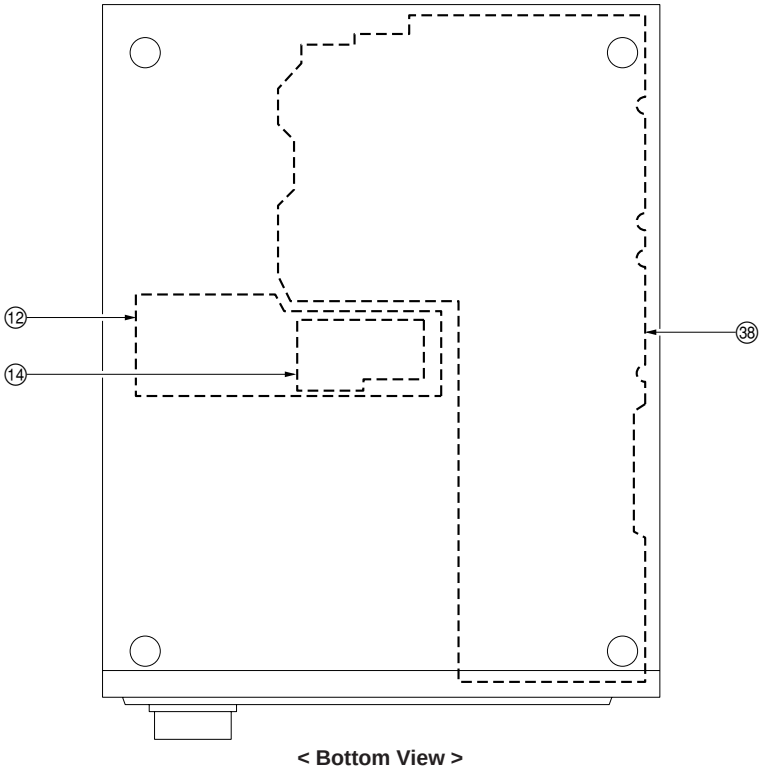
2-8. Location of Main Parts

2-8-1. Printed Circuit Boards and Power Supply Unit Locations

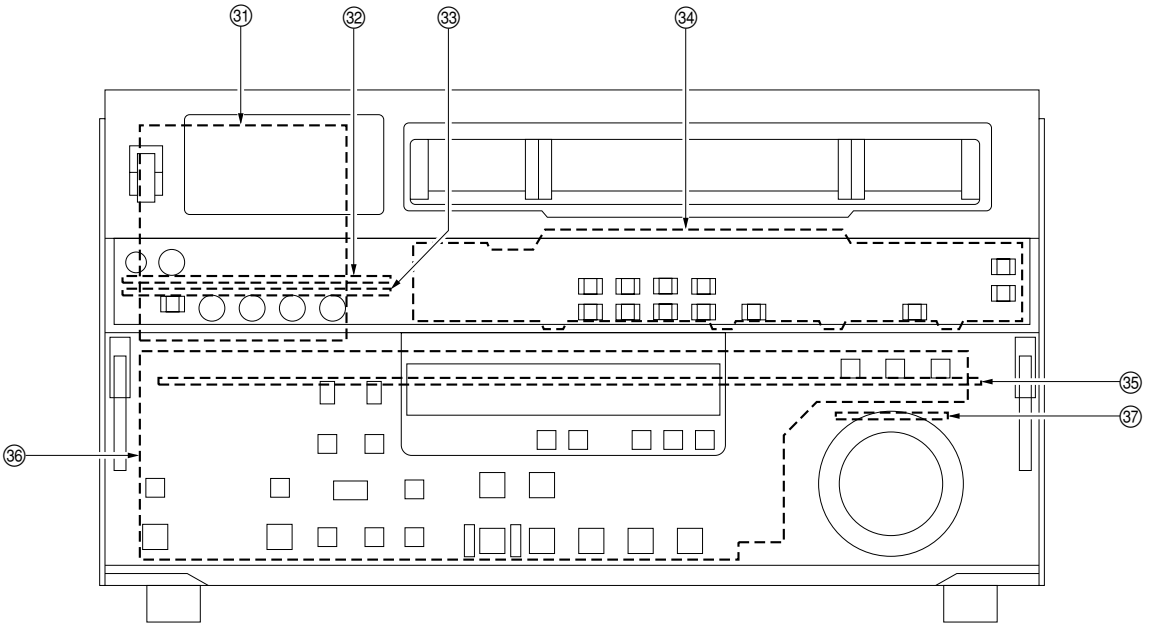
AC-169 ..... ㊺
APR-40C ..... ⑧
AU-260 ..... ⑦
CCM-15 ..... ⑰ ⑱
CL-29 ..... ㉘
CP-278 ..... ㊵
CP-301 ..... ㊷
CP-334 ..... ㊴
CP-335 ..... ㊶
DM-89 ..... ④
DPR-118 ..... ①
DPR-119 ..... ㊼ (BKNW-118)
DPR-150 ..... ㊽ (BKNW-124)
DR-315 ..... ⑫
DT-34D ..... ⑭
EQ-75C ..... ⑨
FP-117 ..... ㉛
KY-438 ..... ㊱
LP-81 ..... ㉙
MB-818 ..... ㊳
MS-58 ..... ⑪
PC-70 ..... ㉚
PD-35 ..... ⑲
PTC-54 ..... ⑯
PTC-59 ..... ㉑
PTC-69 ..... ㊲
PTC-71 ..... ㉖
RM-130 ..... ㊸
RM-179 ..... ㊹
RM-181 ..... ㉒ ㉔
SDI-41C ..... ②
SE-344 ..... ㉓ ㉕
SE-461 ..... ⑮
SS-83 ..... ⑩
SWC-31 ..... ㉟
SWC-35 ..... ㉞
TBC-23A ..... ⑥
TBC-24 ..... ⑤
TC-102 ..... ⑬
TR-78 ..... ㉗
TR-79 ..... ⑳
VPR-47 ..... ③
VR-223 ..... ㉜
VR-224 ..... ㉝
Power supply unit ... ㊻



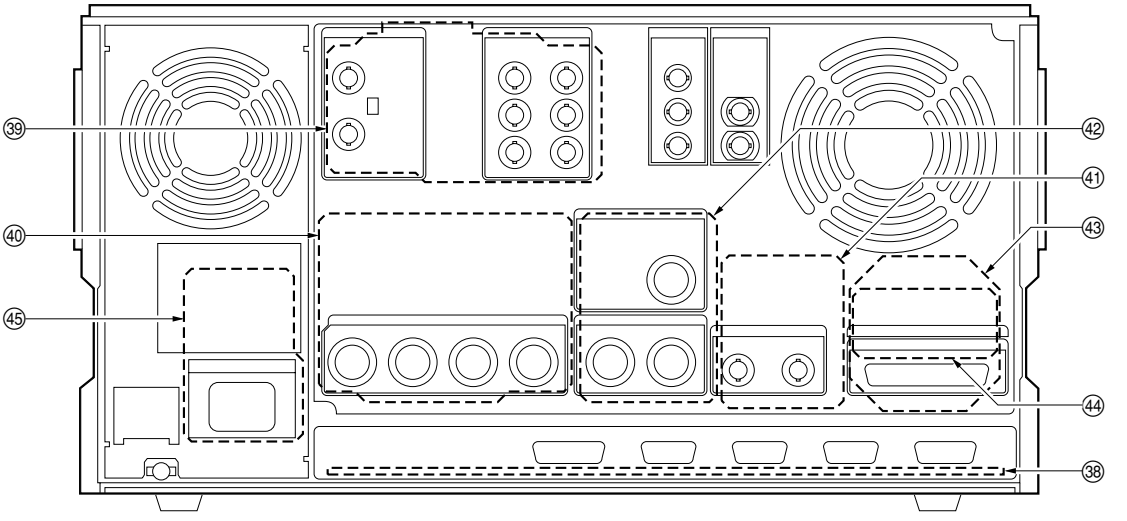
< Top View >



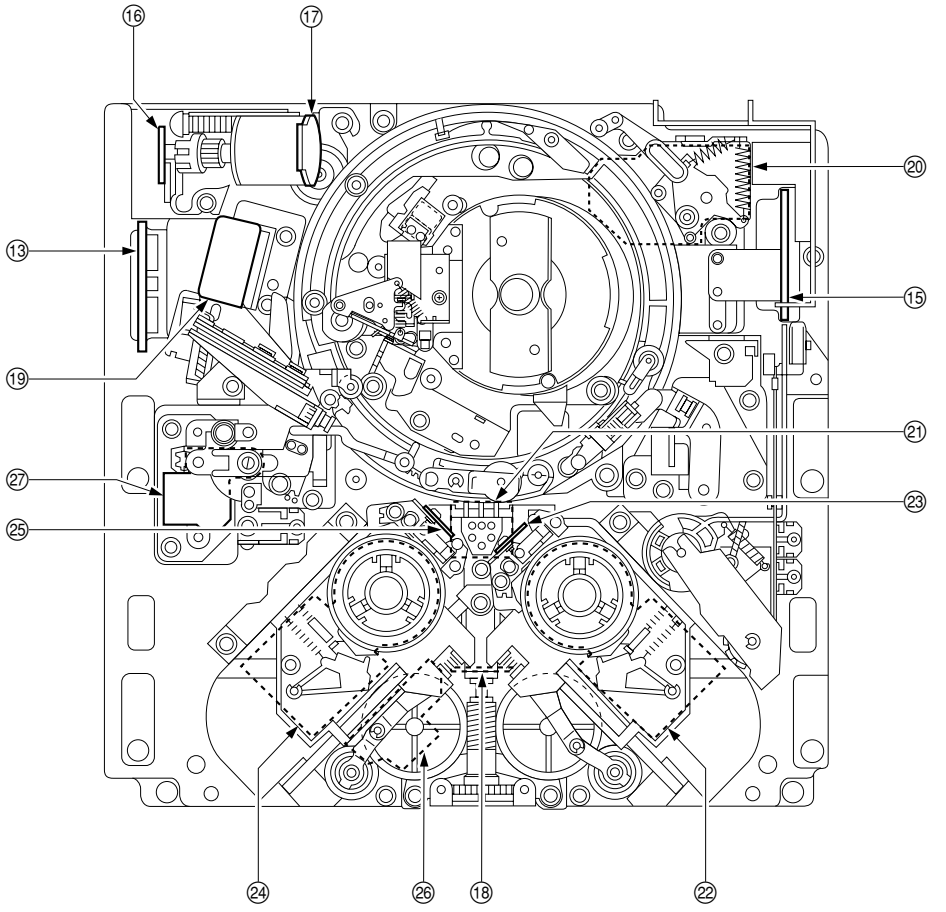
< Bottom View >



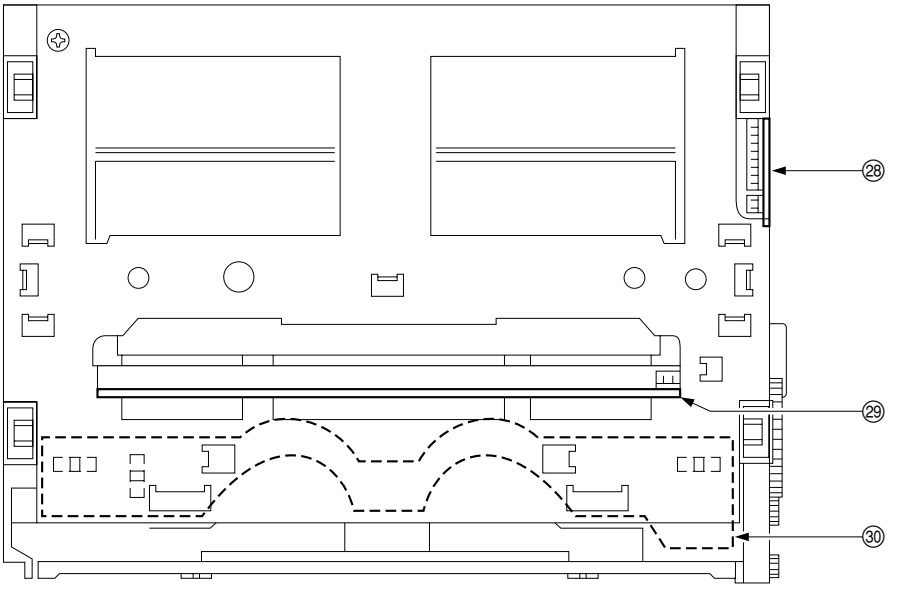
< Front View >



< Rear View >

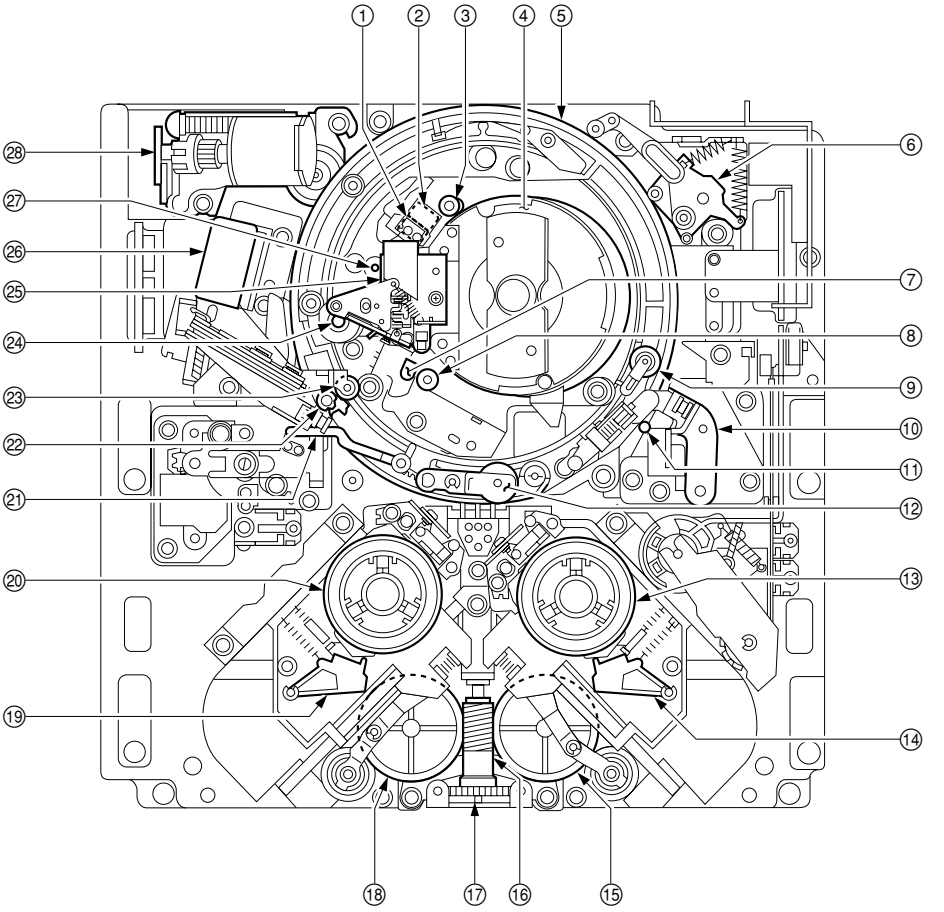


< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

2-8-2. Main Mechanical Part Locations

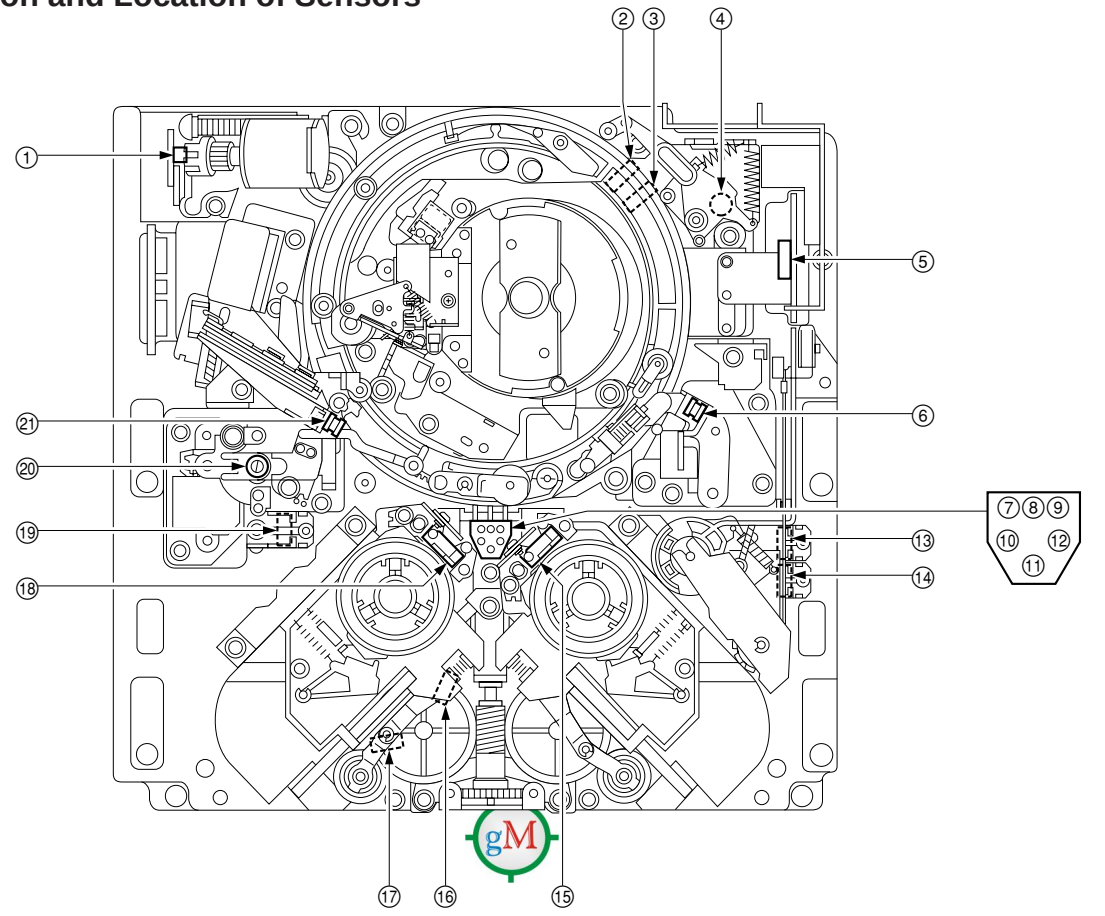


< Top View of Mechanical Deck >

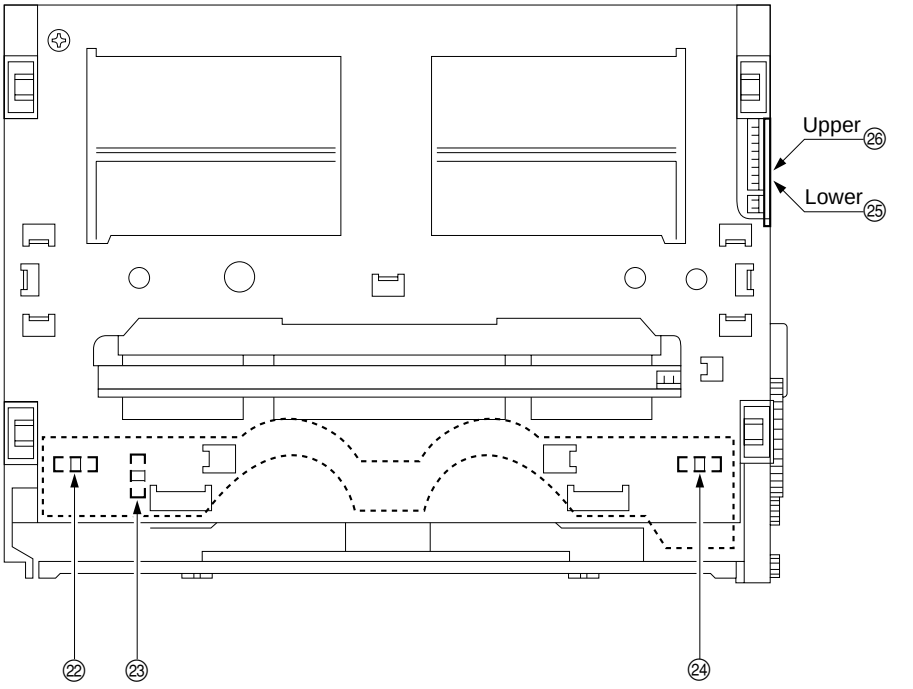
INDEX

① Audio/TC head
② Audio/TC erase head
③ TG-3 tape guide
④ Head drum
⑤ Threading ring
⑥ T tension regulator arm
⑦ CTL head
⑧ TG-2 tape guide
⑨ Audio/TC head cleaner
⑩ T drawer arm
⑪ TG-10 tape guide
⑫ Pinch roller
⑬ T reel table
⑭ T brake assembly
⑮ T worm wheel
⑯ Worm gear
⑰ Drive gear
⑱ S worm wheel
⑲ S brake assembly
⑳ S reel table
㉑ S tension regulator
㉒ Tape cleaner
㉓ TG-0 tape guide
㉔ Capstan shaft
㉕ Cleaning roller block
㉖ Pinch press block
㉗ TG-4 tape guide
㉘ Threading gear block

2-9. Function and Location of Sensors



< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

① **Threading motor FG sensor**
This sensor detects the rotation speed of the threading motor. The output signal of this sensor enters the threading motor servo circuit, and controls the threading/unthreading speed to protect the tape during threading and unthreading operation.

② **Unthreading-end sensor**
③ **Threading-end sensor**
These sensors detect whether the threading ring reaches the threading-end or unthreading-end position.

④ **T tension regulator arm sensor**
This sensor detects the position of a T tension regulator arm. During recording and playback, the output signal of this sensor enters the T reel motor servo circuit, and controls the reel torque to keep a constant T tape tension.

⑤ **Condensation sensor**
This sensor detects whether the dew condensation occurs in the unit.

⑥ **Tape top sensor**
This sensor detects the beginning of the tape, and in addition detects the end of the tape that runs in the reverse direction.

⑦ **Reel hub diameter sensor**
This sensor detects the reel hub diameter detection tab of a cassette.
The reel hub with two types of diameters (thin and thick) is available according to the length of a tape stored in a cassette. This sensor is used to discriminate the diameter. The output signal of this sensor enters the servo circuit of take-up and supply reel motors, and controls the reel rotation speed and torque during tape transport.

⑧ **Metal/oxide tape sensor**
This sensor detects the metal tape detection tab of a Betacam/Betacam SP cassette.
This sensor is used to discriminate whether the tape stored in a Betacam/Betacam SP cassette is an oxide tape or metal particle tape.

⑨ **Tape thickness sensor**
This sensor detects the tape thickness detection tab of a cassette.
This sensor is used to discriminate the thickness of the tape stored in a cassette.

⑩⑪⑫ **Cassette classification sensors**
These sensors detect the three cassette type detection tabs of a cassette.
These sensors are used to discriminate whether a cassette can be used in this unit.

⑬ **L cassette (SP) REC inhibit sensor**
This sensor (switch) detects the condition of a shot-mark REC inhibit plug for the Betacam/Betacam SP large cassette.

⑭ **L cassette (SX) REC inhibit sensor**
This sensor (switch) detects the condition of a shot-mark REC inhibit plug for the Betacam SX large cassette.

⑮ **T reel table FG sensor**
This sensor detects the rotation speed of the take-up reel motor. The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

⑯ **Reel S position sensor**
⑰ **Reel L position sensor**
These sensors detect whether the reel table moves to the correct position according to the size of the inserted cassette.

⑱ **S reel table FG sensor**
This sensor detects the rotation speed of the supply reel motor. The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

⑲ **S cassette REC inhibit sensor**
This sensor (switch) detects the condition of a shot-mark REC inhibit plug for the small cassette.

⑳ **S tension regulator arm sensor**
This sensor detects the position of an S tension regulator arm. During recording and playback, the output signal of this sensor enters the S reel motor servo circuit, and controls the reel torque to keep a constant S tape tension.

㉑ **Tape end sensor**
This sensor detects the end of the tape that runs in the forward direction.

㉒ **Cassette-in sensor (L)**
This sensor detects whether a cassette is being inserted.

㉓ **Cassette size sensor**
This sensor detects whether the inserted cassette is L size or S size.

㉔ **Cassette-in sensor (R)**
This sensor detects whether a cassette is being inserted.

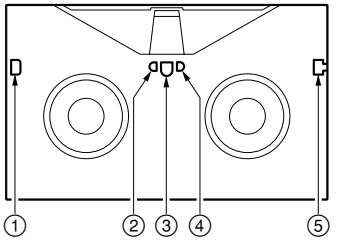
㉕ **Cassette-down (2) sensor**
㉖ **Cassette-down (1) sensor**
These sensors detect the movement (position) of a cassette compartment by the combination of the detection state of the two sensors and a cassette-in sensor.

2-10. System of Cassettes

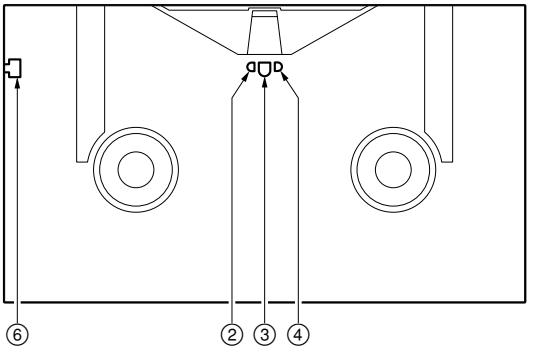
As shown in the figure below, plugs and tabs are provided at the back side of the cassette tape.

Cassette for Betacam or Betacam SP

Small cassette (S cassette)



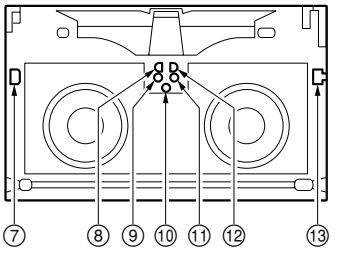
Large cassette (L cassette)



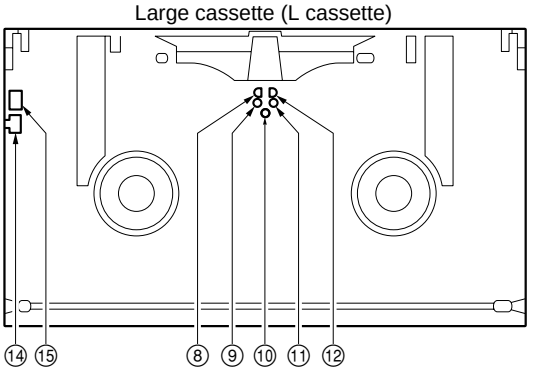
① S cassette REC inhibit tab (for oxide tape)
② Tape thickness detection tab
③ Metal tape detection tab
④ Reel hub diameter detection tab
⑤ S cassette REC inhibit plug (for metal particle tape)
⑥ L cassette REC inhibit plug

Cassette for Betacam SX

Small cassette (S cassette)

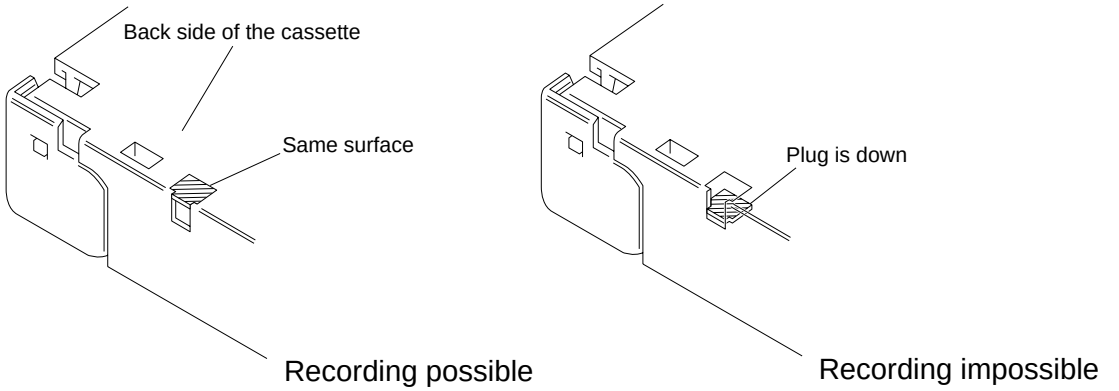


Large cassette (L cassette)



⑦ S cassette analog REC inhibit hole
⑧ Tape thickness detection tab
⑨⑩⑪ Cassette classification detection tabs
⑫ Reel hub diameter detection tab
⑬ S cassette digital REC inhibit tab
⑭ L cassette digital REC inhibit tab
⑮ L cassette analog REC inhibit hole

REC Inhibit Plugs



Detection Tabs

In cassette for Betacam or Betacam SP

No.	Usage	With Tab (Close hole)	Without Tab (Open hole)
②	Tape thickness detection	Thick (Tape thickness is 20 μm)	Thin (Tape thickness is 15 μm)
③	Metal tape detection	Oxide tape	* Metal particle tape
④	Reel hub diameter detection	Small hub	Large hub

* : For the metal particle tape, digital recording can be performed using a Betacam SX format.

In cassette for Betacam SX

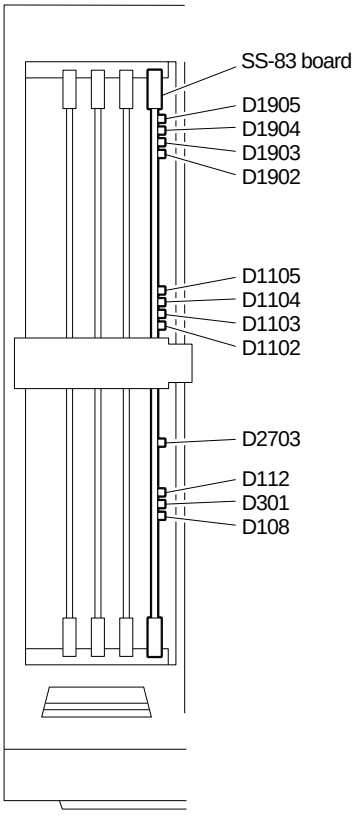
No.	Usage	With Tab (Close hole)	Without Tab (Open hole)
⑧	Tape thickness detection	Tape thickness is 14.5 μm	Tape thickness is other than 14.5 μm
⑫	Reel hub diameter detection	Small hub	Large hub
⑨⑩⑪	Cassette classification detection	Without tab (open hole) at only ⑨ for Betacam SX cassette. Represents the cassette classification by combination of three tabs. (See below)	

Cassette classification detection tabs

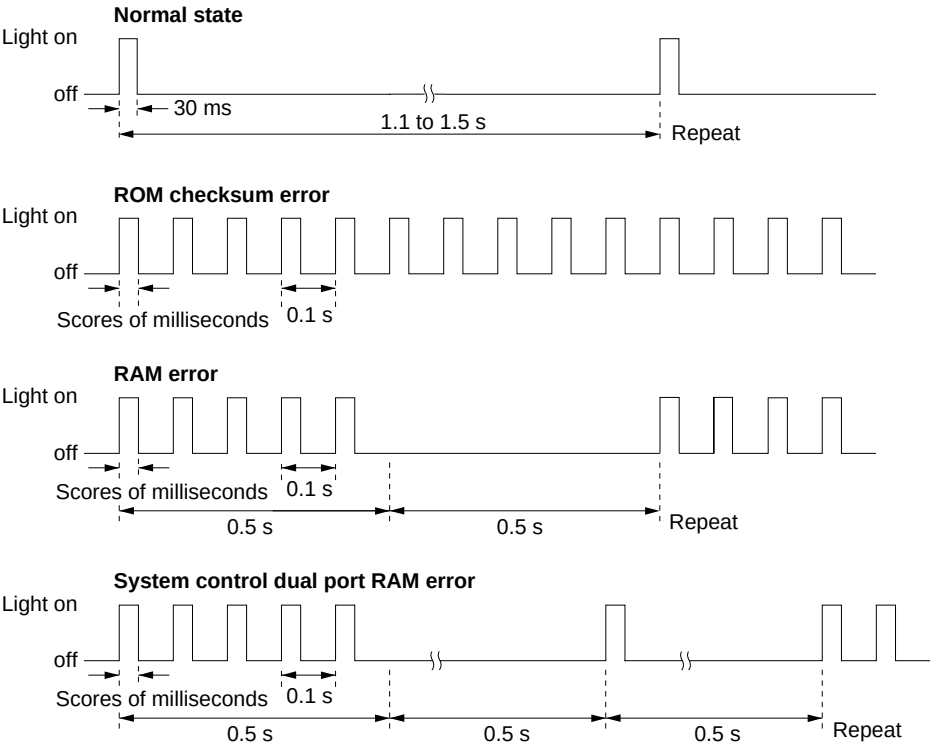
○ : with tab (close hole), ● : without tab (open hole)

State of Tabs ⑨⑪/⑩	Cassette Class	Remark
○○	Betacam or Betacam SP	———
●○	Betacam SX	———
○●	Digital Betacam	Unusable
●●, ○●, ●●, ○●, ●●	Except the above class	Unusable

2-11. Function of LEDs on Circuit Boards



Blinking patterns of D108 on SS-83 board



SS-83 board

LED No.	Name	Color	Description	Normal state
D108	SV	Amber	Represents the result of communication test of ROM and RAM in power-on by blinking pattern. (Refer to the patterns above.)	Blinks
D112	TRVR	Amber	Lights when the tracking VR is enable.	Off
D301	DRUM	Amber	Blinks when the drum microcomputer (IC314) operates normally. Usually lights for 30 milliseconds at intervals of 1.1 to 1.5 second. The blinking interval is inverted when the drum is locked.	Blinks
D1102	SY1 STS1	Green	Blinks when SYS1 CPU operates normally.	Blinks
D1103	SY1 STS2	Green	Lights in good communications between SYS1 CPU and KY MPU (KY-438 board). Turns off in bad communications between SYS1 CPU and KY MPU (KY-438 board).	On
D1104	MAINTE	Green	Lights during executing maintenance mode.	Off
D1105	SY1 ERR	Red	Lights when SYS1 CPU does not operate normally. Blinks in bad communications between SYS1 CPU and other CPU/MPU (SYS2, KY, etc.).	Off
D1902	SY2 STS1	Green	Blinks when SYS2 CPU operates normally.	Blinks
D1903	SY2 STS2	Green	Lights in good communications between SYS2 and SV CPUs. Turns off in bad communications between SYS2 and SV CPUs.	On
D1904	SY2 STS3	Green	Lights in good communications between SYS2 and SYS1 CPUs. Turns off in bad communications between SYS2 and SYS1 CPUs.	On
D1905	SY2 ERR	Red	Lights when SYS2 CPU does not operate normally. Blinks in bad communications between SYS2 CPU and other CPU (SYS1, SV, etc.).	Off
D2703	DT	Amber	Blinks when DT MPU (IC2700) operates normally.	Blinks

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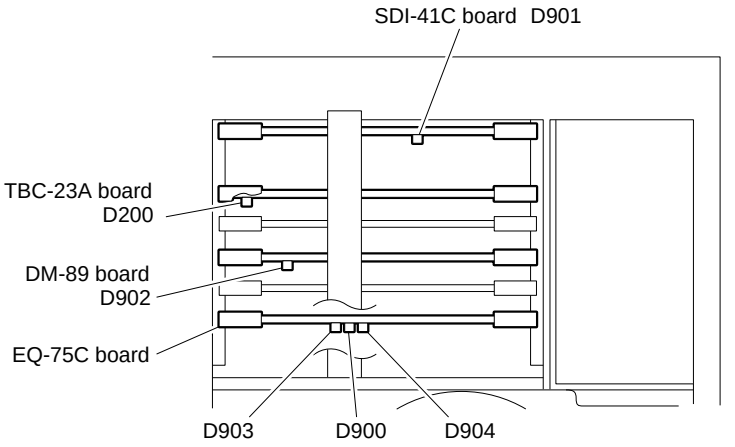


DM-89 board

LED No.	Name	Color	Description	Normal state
D902	ADJUST	Amber	Usually lights for scores of milliseconds at intervals of about one second. The blinking interval is inverted when the DM-89 board is in the adjustment mode: when switch S901-No.1 on DM-89 board is set to ON.	Blinks

EQ-75C board

LED No.	Name	Color	Description	Normal State
D900	—	Amber	Blinks during the EQ microcomputer is under normal operation. Lights in the following cases: • NV-RAM checksum error (when writing/reading in power-on) • NV-RAM verify error (when saving NV-RAM) • INNER ECC status error • Not satisfied requirements in auto-alignment (exclusive of failure and NG) • Not started communications with SYSCON	Blinks
D903	—	Red	Not used.	Don't care
D904	—	Green	Lights in Analog Playback mode. (The unit automatically switches to analog playback mode and light the indicator when the cassette is ejected.)	On/Off

TBC-23A board

LED No.	Name	Color	Description	Normal state
D200	TBC	Amber	Lights once a second when TBC microcomputer is under normal condition.	Blinks

SDI-41C board

LED No.	Name	Color	Description	Normal state
D901	VCO ADJ	Green	Lights when electronic volume (EVR) data comes near the proper value during VCO free-running adjustment in the maintenance mode.	Off

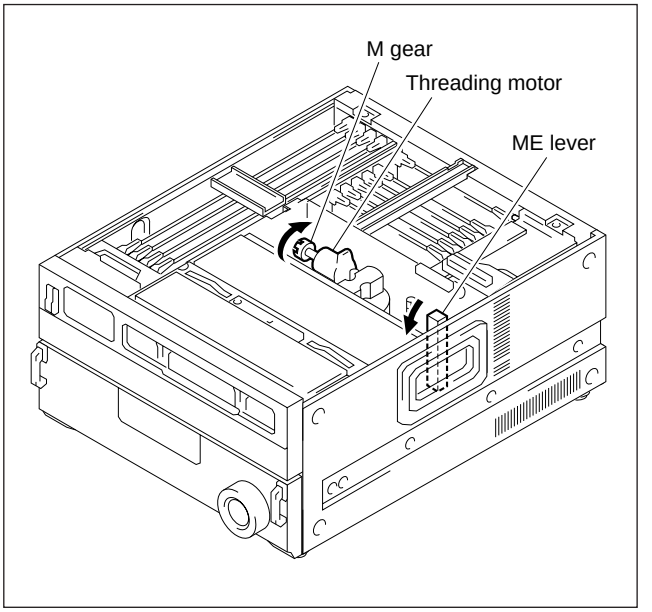
2-12. Taking Out the Cassette in Tape Slacking

When the tape is slacked in this unit, follow the steps below to take out the cassette tape.

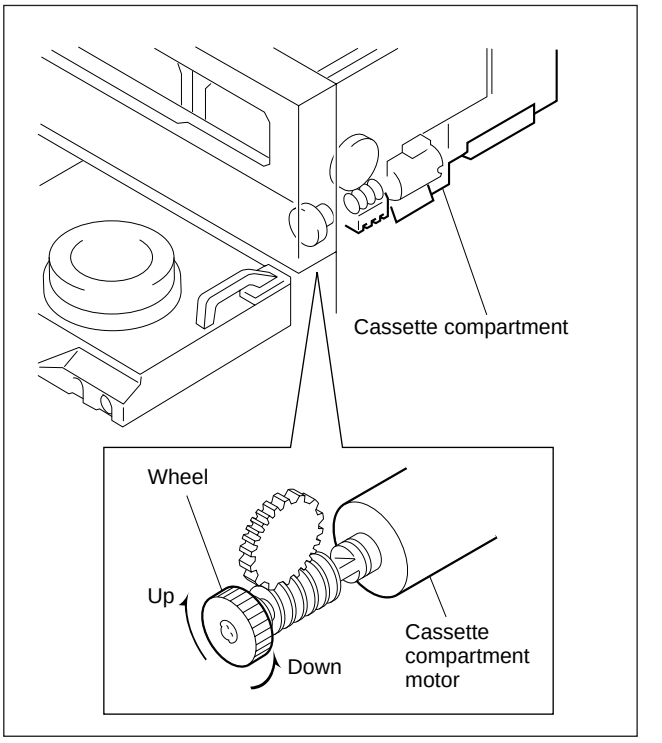
Note

Being careful not to damage the tape, take out the cassette tape with care.

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1.)
3. Remove the plate MD assembly. (Refer to Section 2-4.)
4. Rotate the M gear of the threading motor block in the direction of the arrow with the fingers by about a half turn to slack off the tape.
5. Pull the ME lever toward the front panel side to take up the tape inside the cassette.



6. To wind up the tape, repeat steps 4 and 5.
7. Turn the lower control panel upward. (Operation side up).
8. Turn the wheel of the cassette compartment motor clockwise as shown in the figure until the cassette is completely ejected.

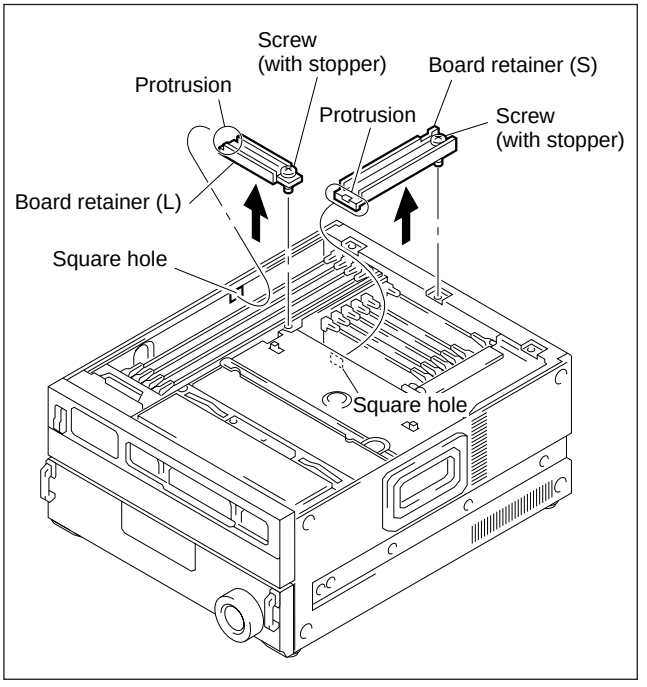


2-13. Removing/Reattaching Plug-in Board

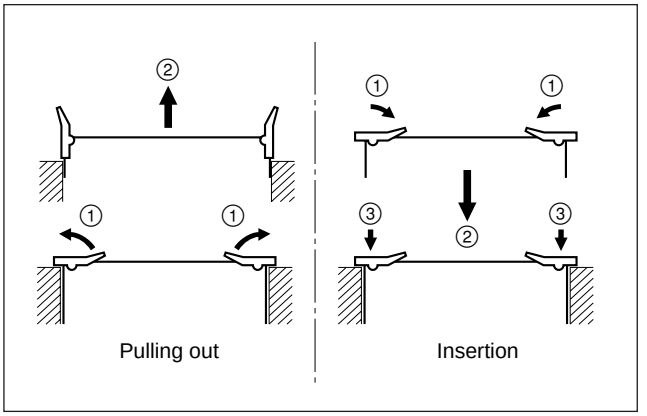
Note

When the plug-in board is replaced, refer to "6-3. Plug-in Boards List".

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1.)
3. To remove the board retainer (L) or (S), fully loosen the screw of it.



4. When removing the TBC-23A or TBC-24 board, disconnect the harness from its board.
   TBC-23A board : CN1 (E-1) ..... 14P White
   TBC-24 board : CN1 (E-1) ..... 14P White
5. Open the eject levers on both end of the board in the direction of the arrows.
6. Hold the eject levers and slowly pull the board out.



7. When removing the AU-260, EQ-75C, or SDI-41C board, disconnect the harnesses or cables from the following connectors on its board.

AU-260 board :	CN100 (B-1)	3P Red
	CN200 (F-1)	3P Yellow
EQ-75C board :	CN100 (B-7)	6P White
	CN500 (A-4)	4P White
	CN600 (G-3)	4P Red
	CN1500 (A-5)	4P Black
	CN1600 (G-5)	4P Yellow
SDI-41C board :	CN700 (F-1)	1P (Orange)
	CN701 (E-1)	1P (Green)
	CN800 (G-1)	1P (Blue)

When removing the DPR-118 board with BKNW-118 (DPR-119 board), disconnect the two cables from the following connectors on the DPR-119 board.

DPR-119 board:	CN1	1P (Orange)
	CN3	1P (Green)

When removing the DPR-150 board of BKNW-124, disconnect the two cables from the following connectors on the DPR-150 board or the piggybacked DIF-109 board onto the DPR-150 board.

DPR-150 board:	CN200	1P (Orange)
(DIF-109 board)	CN201	1P (Green)

When reattaching the board, install in the reverse order of removal.

Notes

- After inserting the board, push in the two folded eject levers simultaneously to firmly connect the plug-in board to the connector on the motherboard (MB-818 board).
- To reattach the board retainer, tighten the screw after inserting the protrusion of the board retainer into the square hole of chassis.

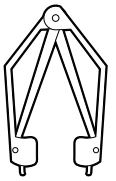
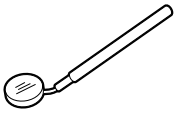
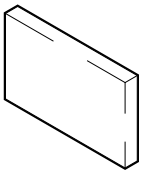
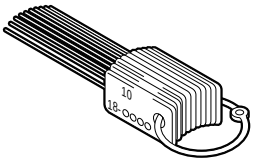
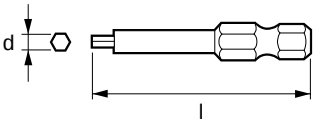
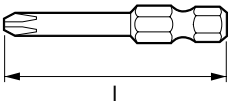
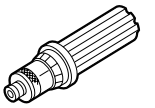
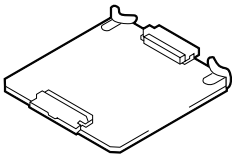
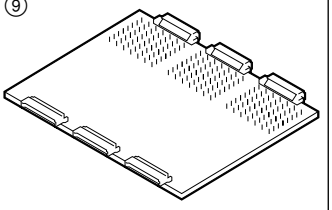
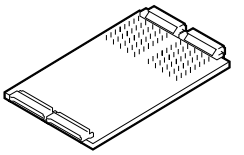
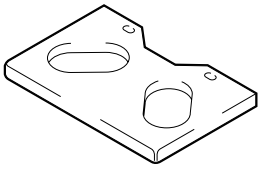
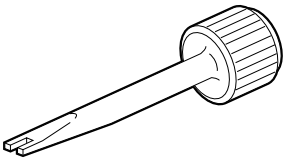
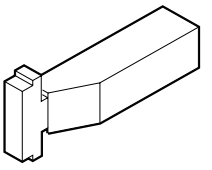
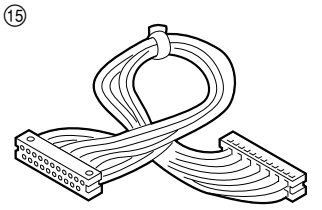
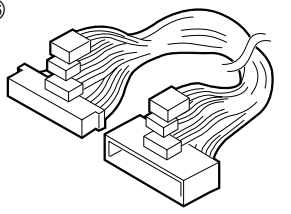
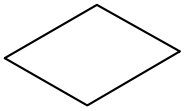
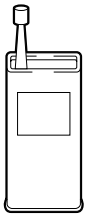
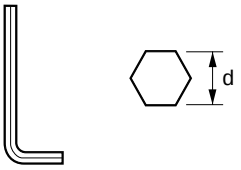
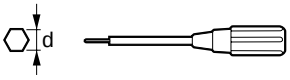
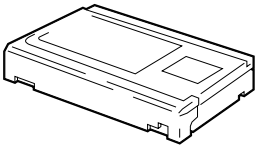
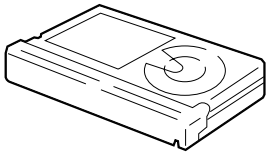
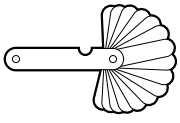
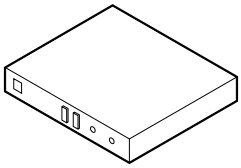
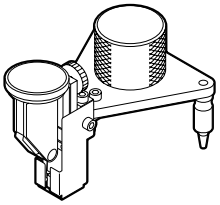
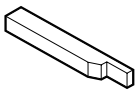
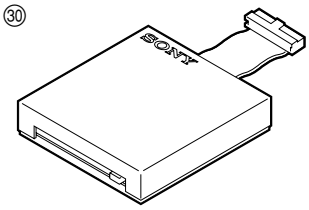
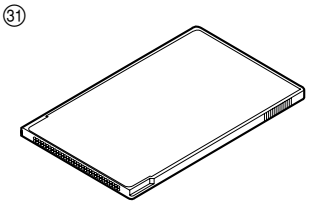
2-14. Fixtures and Adjustment Equipment List

2-14-1. Fixtures

Note

The tools that are used only in the maintenance manual part 2 are also described.

Fig. No.	Part No.	Description	[Inscription No.]	For use
①	J-6035-070-A	Extraction tool (for PLCC socket)	—	Extraction of IC (PLCC type)
②	J-6080-029-A	Small dental mirror (round type ø12)	—	Cassette pillar height adjustment, tape path adjustment
③	J-6086-570-A	Reference flat plate	[SL-657]	AT head zenith adjustment
④	J-6152-450-A	Wire clearance check gauge set	—	Clearance check
⑤	J-6251-090-A	Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm)	—	Tightening screws to fix a drum assembly and upper drum asssembly
	J-6323-440-A	Torque screwdriver's hexagonal bit (d=0.89 mm, l=50 mm)	—	Tightening screws to fix a M gear
⑥	J-6323-420-A	Torque screwdriver's bit (+2 mm, l=75 mm)	—	Tightening screws to fix a brush/slip ring assembly
	J-6323-430-A	Torque screwdriver's bit (+3 mm, l=90 mm)	—	Tightening screws to fix a reel motor assembly or a ring roller
⑦	J-6252-510-A	Torque screwdriver (6 kg•cm)(0.6 N•m)	[JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kg•cm)(1.2 N•m)	[JB-5252]	Tightening screws
⑧	J-6269-810-A	Extension board (S), EX-377	—	Extension of the small-sized plug-in board (DM, TBC)
⑨	A-8277-211-A	Extension board (L), EX-555	—	Extension of the large-sized plug-in board
⑩	A-8277-212-A	Extension board (S), EX-556	—	Extension of the small-sized plug-in board (EQ, AU, SDI)
⑪	J-6320-870-A	Reel motor shaft slantness check fixture	[MW-087]	Reel motor shaft slantness adjustment
⑫	J-6320-880-A	Cassette reference plate (L)	[MW-088]	Reel table height adjustment, Reel motor shaft slantness adjustment
⑬	J-6322-610-A	Tape guide adjustment driver	[MW-261]	Tape path alignment
⑭	J-6329-350-A	Reel table height gauge	[MW-935]	Reel table height adjustment
⑮	1-952-684-11	Extension cable (14P)	—	Extension of the TBC-23A or TBC-24 board
⑯	A-8321-333-A	Power cable assembly (For power supply unit)	—	Extension of the power supply unit
⑰	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	—	Cleaning
⑱	7-432-114-11	Locking compound (200 g)	—	Inhibits loosening of screws
⑲	7-661-018-18	Diamond oil NT-68 (50 ml)	—	
⑳	7-651-000-10	Sony grease SGL-601 (50 g)	—	
㉑	7-700-736-01	L-shaped hexagonal wrench (d=1.27 mm)	—	
	7-700-736-04	L-shaped hexagonal wrench (d=2.5 mm)	—	
	7-700-736-05	L-shaped hexagonal wrench (d=1.5 mm)	—	
	7-700-736-06	L-shaped hexagonal wrench (d=0.89 mm)	—	
㉒	7-700-766-04	Hexagonal wrench driver (d=2.5 mm)	—	
㉓	8-960-075-01	Alignment tape, SR5-1	—	Video/audio alignments (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	—	Servo alignments (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	—	Video/audio alignments (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	—	Servo alignments (for 625/50 system)
㉔	8-960-096-01	Alignment tape, CR2-1B	—	Tracking adjustment (for analog Betacam NTSC)
	8-960-096-41	Alignment tape, CR5-1B (metal particle tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-096-51	Alignment tape, CR2-1B PS	—	Tracking adjustment (for analog Betacam PAL)
	8-960-097-44	Alignment tape, CR5-2A (oxide tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-097-45	Alignment tape, CR8-1A (oxide tape)	—	Audio alignments (for analog Betacam NTSC)
	8-960-096-91	Alignment tape, CR5-1B PS (metal particle tape)	—	Video alignments (for analog Betacam PAL)
	8-960-096-86	Alignment tape, CR8-1B PS (metal particle tape)	—	Audio alignments (for analog Betacam PAL)
	8-960-098-44	Alignment tape, CR5-2A PS (oxide tape)	—	Video alignments (for analog Betacam PAL)
	8-960-098-45	Alignment tape, CR8-1A PS (oxide tape)	—	Audio alignments (for analog Betacam PAL)
㉕	9-911-053-00	Thickness gauge	—	Clearance check
㉖	9-919-573-01	Cleaning liquid	—	Cleaning
㉗	J-6332-240-A	VISC phase adjusting tool	—	VISC alignment for PAL system (for DNW-A65P only)
㉘	J-6530-650-A	Head tip protruction measurement gauge	—	Head tip protrusion check of the video heads
㉙	J-6190-800-A	Tension regulator slantness check tool	[BW-080]	Slant guide slantness adjustment
㉚	A-8319-485-A	IC memory card box, CDS-20 assembly	—	Software update
㉛	1-772-003-11	IC memory card (2 MB), MB98A81183	—	Software update
	1-772-004-11	IC memory card (4 MB), MB98A81273	—	Software update

① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪	⑫ 
⑬ 	⑭ 	⑮ 	⑯ 
⑰ 	⑱ 	⑲	⑳
㉑ 	㉒ 	㉓ 	㉔ 
㉕ 	㉖	㉗ 	㉘ 
㉙ 	㉚ 	㉛ 	

2-14-2. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as a standard product.

Note

These equipment are used in the maintenance manual part 2.

Equipment	Model name	Remarks
Analog composite video signal generator (with GENLOCK mode)	Tektronix 1410	(For 525/60 system)
	Tektronix 1411	(For 625/50 system)
Analog composite video signal generator	Tektronix TSG-170A	(For 525/60 system)
	Tektronix TSG-271	(For 625/50 system)
Spectrum analyzer	Advantest R3261A	With external trigger function Bandwidth: more than 100 MHz
Oscilloscope	Tektronix 2465B	
Analog component waveform monitor	Tektronix WFM300 or WFM300A	For measuring analog component video levels
Serial component waveform monitor	Tektronix WFM601	
Analog composite waveform/vector monitor	Tektronix 1750 or 1780R	For measuring analog composite SC-H (For 525/60 system)
	Tektronix 1751 or 1781R	For measuring analog composite SC-H (For 625/50 system)
Audio analyzer	Tektronix AA501A (OPT 02)	For measuring levels (dBm), distortion, and dB ratio
Audio level meter	Hewlett-Packard HP3400A	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
Monitor with serial digital input	Sony BVM-1311 (with optional accessory BKM-2085-14)	(For 525/60 system)
	Sony BVM-1411 (with optional accessory BKM-2085-14)	(For 625/50 system)
Network analyzer	Anritsu MS420B	
Time code reader	Sony BVG-1500	(For 525/60 system)
	Sony BVG-1500PS	(For 625/50 system)
Terminator	—	75-ohm, BNC type
BNC T adapter	—	75-ohm

2-15. ISR

Overview

This unit corresponds to ISR (Interactive Status Reporting) function. When this unit is connected to the personal computer which activates Sony's ISR application software, the status of this unit or the contents of a generated error can be intensively monitored and managed on the monitor screen of a personal computer. The data displayed on the monitor screen can be stored as a file.

Note

As for ISR application software, method of using or installing the personal computer which can use this software, and the method of concrete operating, refer to ISR protocol manual.
For obtaining it, contact your local Sony Sales Office/Service Center.

The major functions are as follows:

Monitor functions

- Error code and error message (Refer to Section 3.)
- Display of operation status (Equivalent to the display on the video monitor.)

Management functions

- Model name, serial No., destination
- ROM version

Indicating item	Description
Manufacture	Displayed as SONY.
Model name	Displays the model name.
Serial No.	Displays the serial No.
Divece ID	Can give an arbitrary name to this unit and register it.
Destination	Displays the destination. J (For Japan), SYL (For Overseas)
ROM	Displays the information of the ROMs mounted in this unit.

Inspection functions

- Hours meter (Equal to hours meter of the setup menu)
- Error logger

2-16. Battery for Memory Backup

The unit is equipped with a battery for the memory (IC710) backup on the SS-83 board. When replacing, be sure to use the specified part.

Replacement part:	BT710/SS-83 board
Part description:	M4T28-BR12SH1 (lithium battery)
Part No.:	1-767-156-11
Recommended replacement period:	Every seven years

In the memory, the following data is stored. When the battery is dead, or replaced with a new one, resetting current menu, menu banks 1 to 4, and calender/clock is required. For details on how to reset the current menu and menu banks, refer to the operation manual supplied with the unit.
When the battery is dead or replaced, error logs are all cleared.

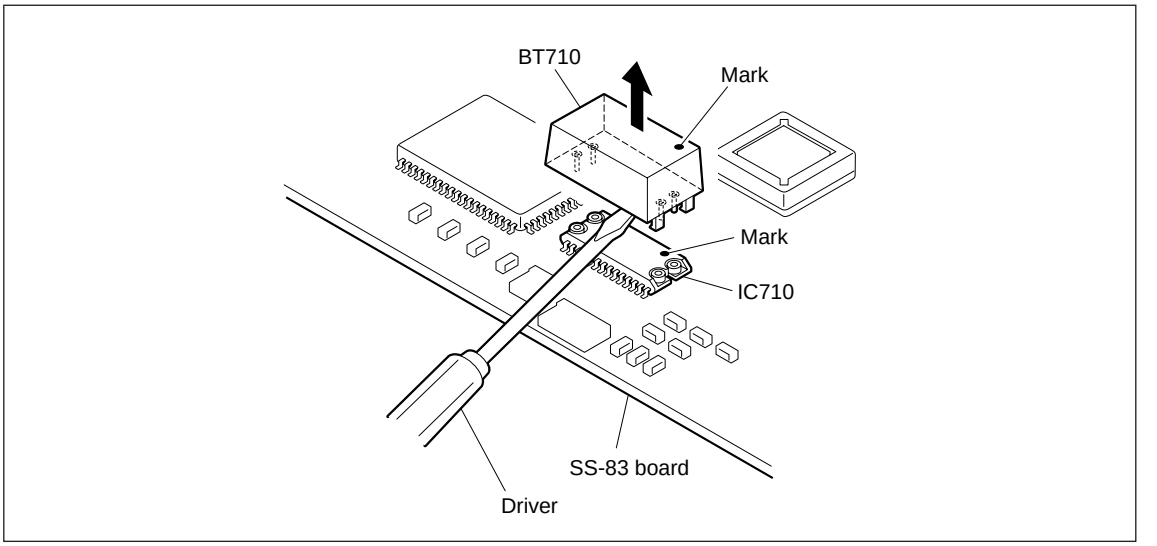
- Current menu
- Menu banks 1 to 4
- Calender/Clock

Replacement

Note

When replacing the battery, ensure that a mark on the battery is correctly oriented as shown in the following figure.

1. Remove the SS-83 board. (Refer to Section 2-13.)
2. Insert a flat blade driver between BT710 and IC710 to remove the battery.
3. Carefully install a new battery, ensuring that the mark's on the BT710 and IC710 are aligned.
4. Reset the current menu and menu banks. (Refer to the operation manual.)
5. Reset the calender/clock. (Refer to Section "4-3-3. Setting Mode".)



2-17. Setup Menu (F-Series)

This section explains the F-series items on the setup menu, which are for use during adjustment or maintenance.
For details on H-, 9- and B-series items, refer to the operation manual supplied with the unit.

2-17-1. Menu Operation

Preparation

The menus for F-series items are usually not accessible. To display them, internal switch setting for the SS-83 board is required. For details on the switch function, refer to Section 1-10.

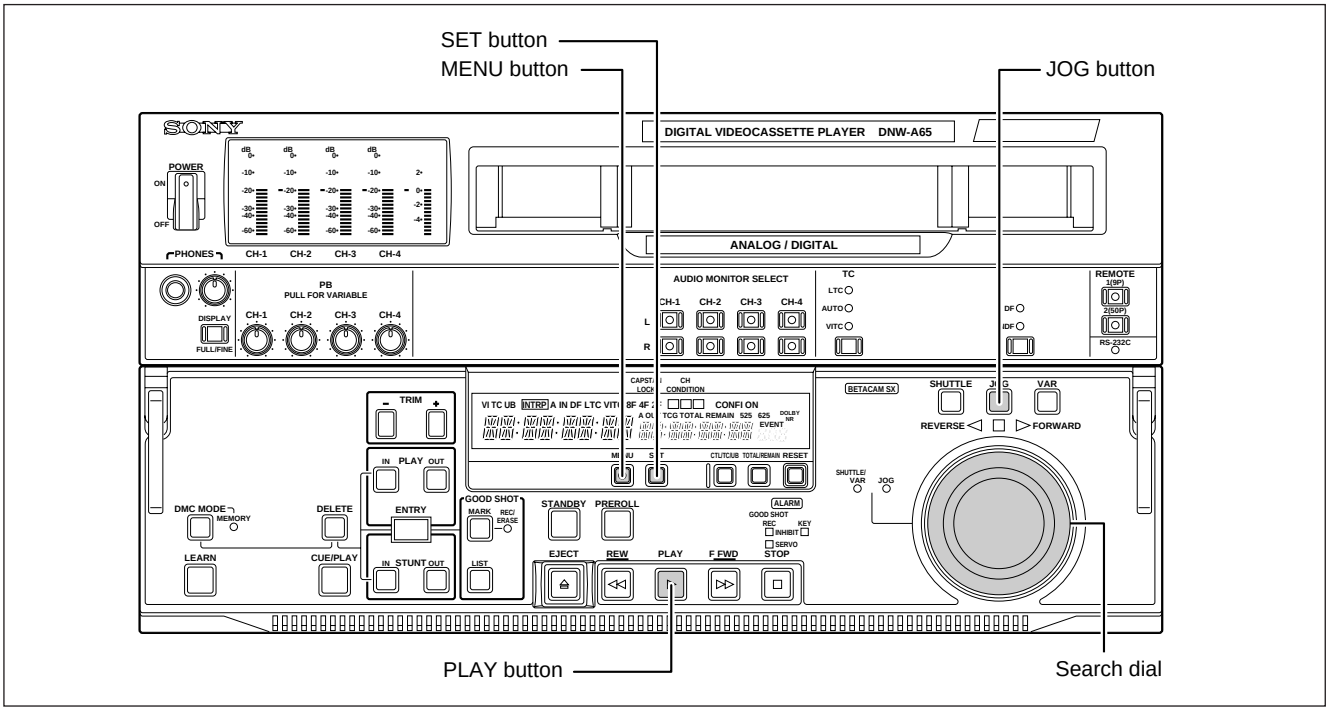
- S1100-1/SS-83 board ⇨ ON (Displays the extended menu of the setup menu)

Activating the menu

1. Press the MENU button.
2. Press the JOG button to enter the JOG mode.
3. Turn the seach dial while pressing the PLAY button.

Basic operation

- **To select ITEM**
  Turn the seach dial while pressing the PLAY button to display the desired ITEM in the time data display area.
- **To change DATA**
  Turn the seach dial while pressing the JOG button.
- **To enter the setting value**
  Press the SET button.



2-17-2. F-Series Items

The F-series items contain the following items.
In the “Settings” columm of the table, the factory default settings are indicated by an enclosing box.

No.	ITEM	Settings	Description
F01	AUDIO NR IN SP MODE	[ON] SW	**Note** This item is used exclusively for analog Betacam longitudinal audio playback adjustment for 625/50 system. After adjustment is completed, return to the factory setting “ON”. Turns on and off the Dolby NR when using a metal tape. ON: Dolby NR is turned on usually SW: Dolby NR switch is turned on and off depending on the setting of the sub control panel **Note** When using an oxide tape, follows the sub control panel switch setting regardless of the above setting.
F02	EMERGENCY TAPE PROTECTION	[ENA] DIS	**Note** This item is used exclusively for servo and mechanical adjustment. After adjustment is completed, return to the factory setting “ENA”. Selects whether emergency tape protection operation is enabled or not when VTR detects error in tape transport mechanism. ENA: Tape protection operation is enabled DIS: Tape protection operation is disabled
F13	TRACKING CONTROL VIA SEARCH DIAL	[OFF] ON	**Note** This item is used exclusively for video tracking adjustment. After adjustment is completed, return to the factory setting “OFF”. Turns on and off the tracking control operation with search dial. OFF: Tracking control with SHUTTLE dial is not activated ON: Tracking control becomes active when turning SHUTTLE dial in PLAY mode
F16	DEVICE TYPE MODIFY:0H	[0] 1 | FFFF	Determines response data to 9-pin remote command DEVICE TYPE REQUEST (00h, 11h). 0: Returns the original device type data of the unit Except 0: Returns the set values as they are: The higher-order two digits are for DATA-1 The lower-order two digits are for DATA-2 **Note** Any selection of the above does not influence the whole VTR operation including TTP. If this item is set to values other than the factory setting “0”, the operation of the unit is not ensured under the 9-pin remote command control.
F21	PROCESS CONT VR LOCAL ENABLE	[ON]* OFF	Selects whether PROCESS CONTROL VR and sub control panel are enabled or not, when LOCAL DISABLE command is received through the 9-pin remote connector or the setup menu “006: LOCAL FUNCTION ENABLE” is set to “DIS” (all disable). ON: Settings of PROCESS CONTROL VR and sub control panel switch are enabled OFF: Settings of PROCESS CONTROL VR and sub control panel switch are disabled **Note** *: When the SY1 ROM version is earlier than 1.33, the factory setting is “OFF”.
F34	STOP PINCH OFF TIME	0 M [5 M] 10 M 15 M 20 M	Specifies the time at which the pinch ON condition is kept even if the PB operation is completed in the SX tape PB mode. The time is usually set to “5 M”. When “0 M” is set, the pinch is turned off as soon as the PB operation is completed. **Note** When the pinch is turned off, it takes a few seconds to output image and sound signals during PB operation of the next time.

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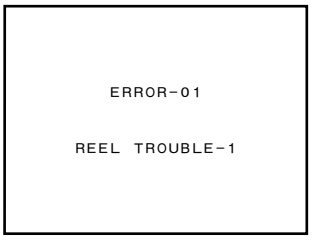
Section 3
Error Message

3-1. Overview of Error Message

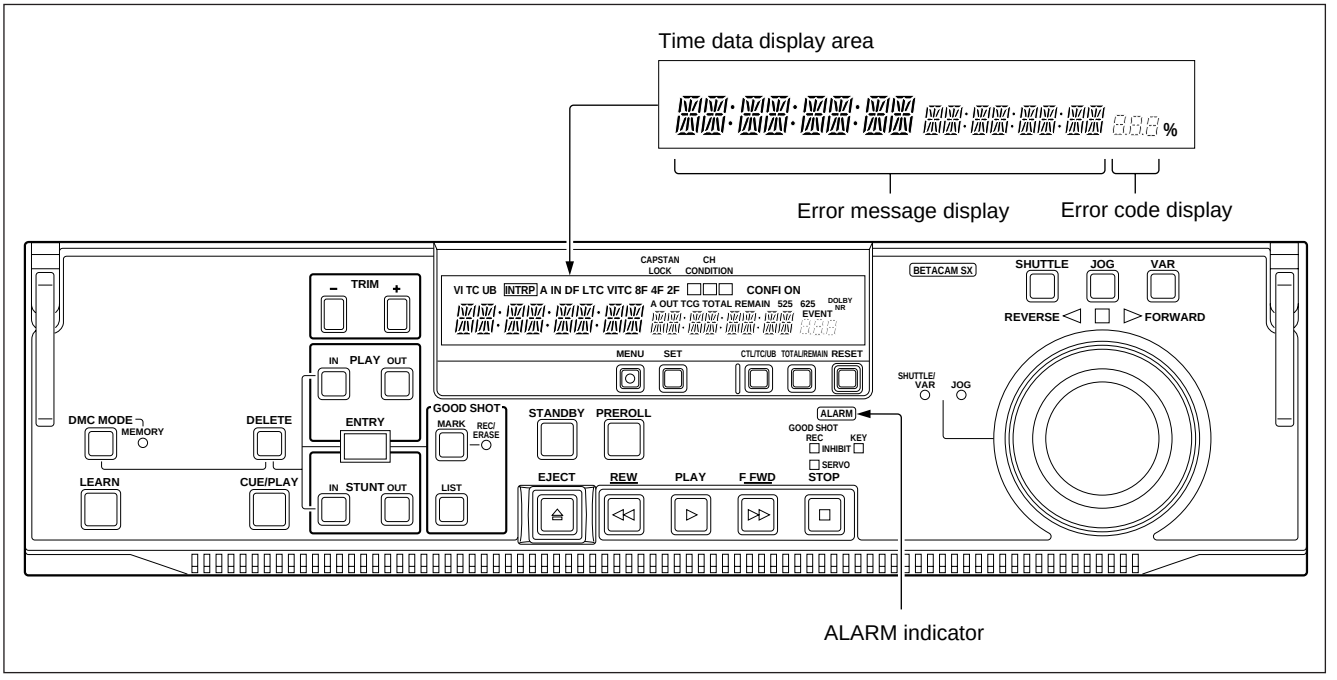
This unit has self-diagnostics function.
When trouble is detected, an ALARM indicator is lighted immediately on the lower control panel, and an error message and error code are displayed in the time data display area and event display area.
Also, an error code and error message are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. Furthermore, as for the some error codes, object which error occurred is displayed as sub error message on the video monitor.



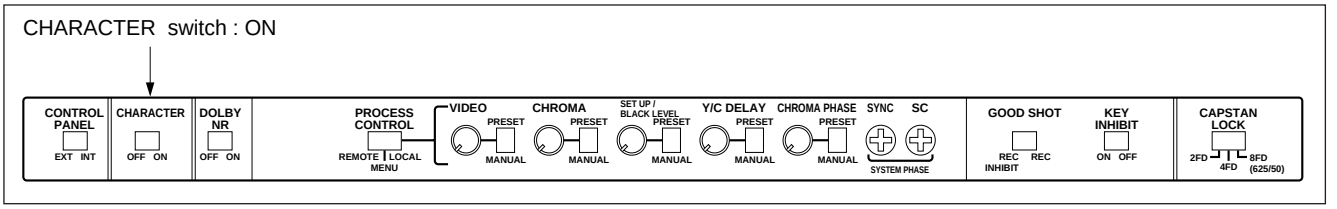
Ex. Superimposed on Video Monitor

Notes

- To superimpose the error message and code on the video monitor, the CHARACTER switch on the sub control panel must be set to ON.
- There are the error messages without error code. These messages are only displayed on the time data display area.
- The error messages with error code are memorized to NV-RAM (Non-volatile RAM) as the error logging data.
  (Refer to Section 4-3 for the error logging data.)
- The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items.



Error Message/Code Display Area and ALARM Indicator



CHARACTER Switch on Sub Control Panel

Error messages are described on Section 3-2 in the order of list.

Error List

Code	Message on time data display area	Page	Description
–	NO COMMUNICATION	3-4	Abnormality in the interface between the lower control panel (KY-438 board) and SYS1 CPU (SS-83 board) is detected in the lower control panel side.
01	REEL TROUBLE	3-4	Tape slacking is detected in the threading or unthreading operation.
02	REEL TROUBLE	3-5	Tape slacking or tape breaking is detected in the SEARCH, FF, or REW mode.
03	REEL TROUBLE	3-6	Tape slacking, tape breaking, or supply or take-up reel locking is detected in the PLAY mode.
04	REEL TROUBLE	3-7	A malfunctional tape transport speed is detected in the FF or REW mode.
05	REEL TROUBLE	3-7	The malfunctional operation of the supply or take-up reel is detected during cassette insertion.
06	TAPE TENSION	3-8	Excessive tape tension is detected in the PLAY mode.
07	CAPSTAN TROUBLE	3-8	Malfunction of capstan motor is detected.
08	DRUM TROUBLE	3-9	Malfunction of drum motor is detected.
09	TH/UNTH MOTOR	3-9	Malfunction of threading or unthreading operation is detected.
0A	THREADING	3-10	It is detected that the tape top processing is not completed in the threading mode.
10	HUMID	3-10	Dew condensation is detected.
11	TAPE T/E SENSOR	3-11	The tape top and tape end are detected simultaneously.
12	TAPE TOP SENSOR	3-11	Malfunction of tape top sensor is detected.
13	TAPE END SENSOR	3-12	Malfunction of tape end sensor is detected.
14	FAN MOTOR	3-13	Malfunction of cooling fan motor is detected.
20	CASS COMP MOTOR	3-14	Malfunction of cassette compartment-up or down operation is detected.
21	REEL SFT MOTOR	3-14	Malfunction of movement of the reel table corresponding to the cassette size is detected.
22	REEL POS SENSOR	3-15	The L-cassette and S-cassette positions of the reel table are detected simultaneously.
23	THRED RING SENS	3-15	The thread end and unthread end states of the threading ring are detected simultaneously.
92	INTERNAL I/F 1	3-16	Abnormality in the interface between SYS1 CPU (on SS-83 board) and other CPU/MPU is detected.
93	CPU INITIALIZE ERROR	3-17	Abnormality in the interface between SV CPU (on SS-83 board) and DT MPU (on SS-83 board) or DRUM CPU (on SS-83 board) is detected.
95	OTHERS NV-RAM ERROR	3-17	Abnormality operation of an NV-RAM on RM-179 board is detected.
96	SY NV-RAM ERROR	3-18	The abnormal operation of an NV-RAM (on SS-83 board) for the system control system is detected.
97	SV NV-RAM	3-19	The abnormal operation of an NV-RAM (on MS-58 board) for the servo system is detected.
98	RF NV-RAM ERROR	3-19	The abnormal operation of an NV-RAM (on EQ-75C, DM-89, or TBC-23A board) for the RF system is detected.
99	INTERNAL I/F 2	3-20	Abnormality in the interface between SYS2 CPU (on SS-83 board) and SERVO CPU (on SS-83 board) or MPU (on EQ-75C, DM-89, TBC-23A, or SDI-41C board) or FL (level meter module) is detected.

Notes

- Error codes 01 through 14 are detected in both/one of the SS-83 and/or MS-58 boards.
  Error codes 20 through 23 are detected in the MS-58 board.
  Error codes 92 through 99 are detected in the SS-83 board.
- There are two error groups of error codes: VTR and OTHERS. If errors occur in multiple error groups, the error message of each group are switched at two-second intervals.
  Also, if multiple errors occur in error group, the priority level of each group display are as follows:
  VTR: 97, 02, 03, 04, 05, 07, 06, 01, 09, 08, 0A, 10, 11, 12, 13, 14, 20, 21, 22, 23
  OTHERS: 92, 96, 98, 99, 93, 95

3-2. Details of Error Messages

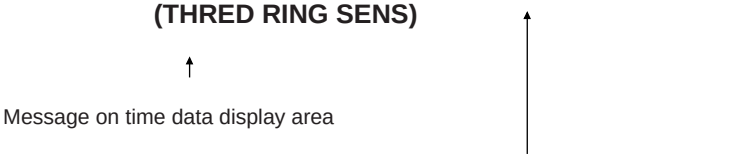
CAUTION

The “protection mode” described in this section means the servo control system automatically stops the tape transport and drum motor rotation, and maintains this state. The DNW cannot be automatically recovered to the normal state when the DNW once enters the protection mode. Be sure to turn on the power again under the absence of the cassette tape.
If the protection mode is entered with the cassette tape inserted, take out the cassette tape manually with reference to “2-12. Taking Out the Cassette in Tape Slacking”. Never turn on the power again without taking out the cassette tape. This may damage the tape.

Note

The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items. In this section, each message indicates as following example.

Ex. : ERROR-23 THREADING RING POSITION ERROR
(THRED RING SENS)



(NO COMMUNICATION)

Description: Abnormality in the interface between the lower control panel's MPU (KY-438 board) and SYS1 CPU (SS-83 board) was detected.

Note

This error message is only displayed on the time data display area in that the abnormality of the interface is detected in the lower control panel side.

Detecting condition: When the lower control panel's MPU (IC104 on KY-438 board) is received no interface signal from SYS1 CPU (IC704 on SS-83 board) for more than two seconds.

Possible causes:
- Cable connection defect or disconnection
- Line receiver/transceiver (IC102 on KY-438 board) trouble
- SIO (IC1102 on SS-83 board) trouble

Protecting operation: None

ERROR-01 REEL TROUBLE - 1 (REEL TROUBLE)

Description: Tape slacking was detected during threading or unthreading.

Detecting conditions:
1) When no take-up reel FG can be detected in the unthread operation just after activation.
2) When the relation between the take-up reel FG and threading FG is out of the specification in operations other than unthread just after activation.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of take-up reel FG detection block
- Take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Take-up reel motor trouble
- Take-up reel motor drive circuit (DR-315 board) trouble
- Take-up reel brake trouble
- Take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Servo adjustment defect on take-up reel
- Harness disconnection
- Take-up reel table height adjustment defect

Protecting operation: Enters the protection mode.

CAUTION

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-02 REEL TROUBLE - 2 (REEL TROUBLE)

Description: Tape slacking or tape breaking was detected in SEARCH, FF, or REW mode.

Detecting conditions:
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-58 board) trouble
- Take-up torque insufficiency during REW due to supply tension sensor or supply tension detector circuit (MS-58 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode. The normal state may be returned after the protection mode is entered at the end of the tape.

CAUTION

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-03 REEL TROUBLE - 3 (REEL TROUBLE)

Description: Tape slacking, tape breaking, or supply or take-up reel locking was detected in the PLAY mode.

Detecting conditions:
1) When the take-up value is lower than the specified value with respect to the tape supply value.
2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.
4) When the tension value calculated from the supply tension sensor output is less than 15 g continuously for more than three seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-58 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode.

CAUTION

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

ERROR-04 REEL TROUBLE - 4 (REEL TROUBLE)

Description: Abnormal tape transport speed was detected in the FF or REW mode.

Detecting condition: When the tape speed calculated from the supply reel FG and take-up reel FG is under a half of the specified tape speed continuously for more than four seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ∗ The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel motor trouble
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Stops the tape transport and enters the rest state.

ERROR-05 REEL TROUBLE - 5 (REEL TROUBLE)

Description: Abnormal supply reel or take-up reel operation was detected in a diagnosis during cassette insertion.

Detecting conditions:
1) When the supply reel FG or take-up reel FG count is less than the specified value with the reel rotated.
2) When the supply reel FG or take-up reel FG count is more than the specified value with the reel stopped.

Sub error message: None

Possible causes:
- Supply or take-up reel FG sensor (SE-461 board) trouble or clearance adjustment defect
- Supply or take-up reel FG waveform shaper circuit (MS-58 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection

Protecting operation: Ejects the cassette.

ERROR-06 TAPE TENSION ERROR (TAPE TENSION)

Description: Excessive tension was detected in the PLAY mode.

Detecting condition: When the tension value calculated from supply tension sensor output is more than 55 g continuously for more than three seconds.

Sub error message: None

Possible causes:
- Cassette compartment trouble or installation defect
  - ✻ The reel did not rotate because the cassette was lifted-up from the specified position.
- Supply tension sensor or its related circuit (MS-58 board) trouble
- Supply reel motor trouble
- Supply reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply reel and supply tension sensor
- Supply reel brake trouble
- Supply reel brake solenoid drive circuit (MS-58 board) trouble
- Harness disconnection

Protecting operation: Stops the tape transport and enters the rest state.

ERROR-07 CAPSTAN TROUBLE (CAPSTAN TROUBLE)

Description: Malfunction of capstan motor was detected.

Detecting conditions:
1) When the capstan FG count is less than the specified value in a diagnosis during cassette insertion.
2) When the frequency calculated from the capstan FG is out of the specification in the PLAY or SEARCH mode.
3) When CAPSTAN FG(A) NOR signal and CAPSTAN FG(B) NOR signal interruption are not normal for about 40 ms in the PLAY mode.

Sub error message: None

Possible causes:
- Capstan motor trouble
- FG sensor trouble in capstan motor
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan motor FG waveform shaper circuit (MS-58 board) trouble
- Capstan FG duty adjustment defect

Protecting operations: Ejects the cassette for No. 1 in detecting conditions.
Stops the tape transport and enters the rest state for No. 2 and No. 3 in detecting conditions.

ERROR-08 DRUM TROUBLE (DRUM TROUBLE)

Description: Malfunction of drum motor was detected.

Detecting condition: When the drum FG cycle is shifted more than about ±30 % continuously for more than 10 seconds as compared with during normal rotation.

Sub error message: None

Possible causes:
- Drum motor trouble
- Drum microcomputer (IC314 on SS-83 board) trouble
- Drum motor drive circuit (DR-315 board) trouble
- Drum FG/PG waveform shaper circuit (DR-315 board) trouble
- Assembly defect during upper drum replacement

Protecting operation: Stops the tape transport and enters the rest state in the unthread end state.

ERROR-09 TH/UNTH MOTOR TIME OUT (TH/UNTH MOTOR)

Description: Malfunction of threading or unthreading operation was detected.

Detecting conditions:
1) When no operation is completed within about six seconds after operation start.
2) When no threading FG is output within about 0.4 second during threading motor drive.
3) When states other than unthread end are continued for more than six seconds in case that the unit should be in the unthread end state.

Sub error message: None

Possible causes:
- Unthread end sensor (TR-79 board) trouble
- Thread end sensor (TR-79 board) trouble
- Thread end/unthread end input port (IC1 on MS-58 board) trouble
- Threading motor trouble
- Threading FG sensor (PTC-54 board) trouble
- Threading FG waveform shaper circuit (MS-58 board) trouble
- Threading motor drive circuit (DR-315 board) trouble
- Threading mechanism trouble

Protecting operations: Ejects the cassette during cassette insertion or ejection.
Enters the protection mode during tape threading/unthreading.
Stops the tape transport and enters the rest state in cases except the above.

ERROR-0A THREADING TROUBLE (THREADING)

Description: It was detected that the tape top processing in the thread state is not completed.

Detecting condition: When the tape top is detected again after it is processed.

Tape top processing

In this processing, the tape is slightly forwarded without taking out the tape after unthread because the tape top was detected during threading.
(Short FF)

Sub error message: None

Possible causes:
- Take-up reel motor trouble
- Servo adjustment defect on take-up reel
- Take-up reel motor drive circuit (DR-315 board) trouble
- Tape top sensor trouble
- Tape top detection circuit (MS-58 board) trouble
- Tape top input port (IC115 on SS-83 board) trouble
- Tape abnormality

Protecting operation: Enters the rest state in the unthread end state.

ERROR-10 HUMID (HUMID)

Description: Dew condensation was detected.

Detecting condition: When the condensation sensor detects dew condensation continuously for about two seconds.

Sub error message: None

Possible causes:
- Actual dew detection (When the operating environment rapidly changes from low temperature to high temperature and high humidity)
- Condensation sensor trouble
- Dew input port (IC1 on MS-58 board) trouble

Protecting operations: Prohibits the cleaning roller operation.
Stops the tape transport and enters the rest state in the unthread end state when the tape is threaded in states other than PLAY mode.
Prohibits the tape threading.
Prohibits the cassette insertion.

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ERROR-11 TAPE TOP/END SENSOR TROUBLE (TAPE T/E SENSOR)

Description: The tape top and tape end were detected simultaneously.

Detecting condition: When the simultaneous detection of the tape end and tape top is continued for more than seven seconds.

Sub error message: None

Possible causes:
- Tape top sensor or tape end sensor trouble
- Tape top or tape end detection circuit (MS-58 board) trouble
- Tape top/tape end input port (IC115 on SS-83 board) trouble
- Harness disconnection

Protecting operation: Stops the tape transport and enters the rest state during tape transport.

ERROR-12 TAPE TOP SENSOR TROUBLE (TAPE TOP SENSOR)

Description: Malfunction of tape top sensor was detected.

Detecting condition: When the tape top is detected continuously for more than seven seconds.

Sub error message: None

Possible causes:
- Tape top sensor trouble
- Tape top detection circuit (MS-58 board) trouble
- Tape top input port (IC115 on SS-83 board) trouble
- Harness disconnection
- The tape cannot move at the tape top due to troubles other than the tape sensor.

Protecting operations: In the FF mode, continues the operation until the tape end is detected. Stops the tape transport and enters the rest state when the tape end is detected.
During tape transport in forward direction, the FF mode can be entered only while the total tape quantity is observed.
Stops the tape transport and enters the rest state during tape transport except the above.

ERROR-13 TAPE END SENSOR TROUBLE (TAPE END SENSOR)

Description: Malfunction of tape end sensor was detected.

Detecting condition: When the tape end is detected continuously for more than seven seconds.

Sub error message: None

Possible causes:
- Tape end sensor trouble
- Tape end detection circuit (MS-58 board) trouble
- Tape end input port (IC115 on SS-83 board) trouble
- Harness disconnection
- The tape cannot move at the tape end due to troubles other than the tape sensor.

Protecting operations: In the REW mode, continues the operation until the tape top is detected. Stops the tape transport and enters the rest state when the tape top is detected.
During the tape transport in reverse direction, the REW mode can be entered only while the total tape quantity is observed.
Stops the tape transport and enters the rest state during tape transport except the above.

ERROR-14 FAN MOTOR TROUBLE (FAN MOTOR)

Description: Malfunction of cooling fan motor was detected.

CAUTION

If this error occurred, stop immediately operation of the unit, and turn off the power.
If the unit uses continuously under the fan is stopped state, overhearting inside the unit can cause a fire or a failure.

Detecting condition: When the fan motor FG frequency is less than the specified value continuously for more than one second.

Sub error message: None

Possible causes:
- Fan motor trouble
- Fan motor FG input port (IC115 or IC500 on SS-83 board) trouble
- Fan motor control port (IC500 on SS-83 board) trouble
- Fan motor power switch circuit (MB-818 board) trouble

Protecting operation: None

Note

This unit has three fan motors.
When the above detecting condition is satisfied by any fan motor, this error occurs.
Relations of fan motors and operation state, ports, power switch circuit are as follows.

Use	Operation state	FG input port	Control port	Power switch circuit
For rear	Always rotating	IC500/SS-83 board	None	None
For mechanical deck	Always rotating	IC115/SS-83 board	IC500/SS-83 board	Q1 and Q2/MB-818 board
For power supply unit	Always rotating	IC115/SS-83 board	None	None

ERROR-20 CASSETTE COMPARTMENT MOTOR LOCK (CASS COMP MOTOR)

Description: Malfunction of cassette compartment-up or down operation was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:
- Cassette compartment block trouble
- Cassette compartment motor drive circuit (DR-315 board) trouble
- Cassette-down sensor (CL-29 board) trouble
- Cassette-down input port (IC1 on MS-58 board) trouble

Protecting operation: Stops the movement of the cassette compartment and reel table until a cassette eject button is pushed.

ERROR-21 REEL SHIFT MOTOR LOCK (REEL SFT MOTOR)

Description: Malfunction of movement of the reel table corresponding to the cassette size was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:
- Reel shift mechanism trouble
- Reel shift motor trouble
- Reel shift motor drive circuit (DR-315 board) trouble
- Reel position sensor (PTC-71 board) trouble (S position sensor or L position sensor)
- Reel position input port (IC1 on MS-58 board) trouble

Protecting operation: Stops the movement of the reel table and ejects the cassette during cassette loading.

ERROR-22 REEL POSITION SENSOR TROUBLE (REEL POS SENSOR)

Description: The L and S cassette positions of the reel table were detected simultaneously.

Detecting condition: When the L and S position sensors detect the L and S cassette positions, respectively at the same time.

Sub error message: None

Possible causes:
- S position sensor (PTC-71 board) trouble
- L position sensor (PTC-71 board) trouble
- Reel position input port (IC1 on MS-58 board) trouble

Protecting operation: If possible, ejects the cassette, when an error occurs during cassette insertion.
Prohibits the cassette insertion.

ERROR-23 THREADING RING POSITION ERROR (THRED RING SENS)

Description: The thread end and unthread end states were detected simultaneously.

Detecting condition: When the thread end and unthread end sensors detect the thread end and unthread end states, respectively at the same time.

Sub error message: None

Possible causes:
- Thread end sensor (TR-79 board) trouble
- Unthread end sensor (TR-79 board) trouble
- Thread end or unthread end input port (IC1 on MS-58 board) trouble

Protecting operations: Ejects the cassette during cassette insertion or ejection.
Enters the protection mode during tape threading/unthreading.
Stops the tape transport and enters the rest state in cases except the above.

ERROR-92 INTERNAL INTERFACE ERROR 1 (INTERNAL I/F 1)

Description: Abnormality was detected in the communication between SYS1 CPU (IC704 on SS-83 board) and other CPU/MPU.

Sub error messages and Detecting conditions:

SY2: When the SYS2 CPU (IC1505 on SS-83 board) initialization at power-on is in abnormal state.

KY: When the communication with KY-438 board's MPU (IC104) is in abnormal state.

FP: When the communication with FP-117 board's MPU (IC6) is in abnormal state.

50PIN: When the communication with RM-130 board is in abnormal state.

RM NVRAM: When the communication with RM-179 board is in abnormal state.

Possible causes:

SY2:
- DIP switch (S1900 on SS-83 board) setting defect
- Common RAM (IC2500 on SS-83 board) trouble
- System control system SY-2 area (IC1500 series on SS-83 board) trouble

KY:
- Cable (between MB-818 board and KY-438 board) connection defect or disconnection
- Interface circuit (IC1102 through 1105 on SS-83 board) trouble
- Line receiver/transceiver (IC102 on KY-438 board) trouble
- KY-438 board's MPU (IC104) trouble

FP:
- Cable (between MB-818 board and FP-117 board) connection defect or disconnection
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- FP-117 board's MPU (IC6) trouble

50PIN:
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- RM-130 board's MPU (IC2) trouble

RM NVRAM:
- MPU control interface circuit (IC1400 through 1402 on SS-83 board) trouble
- IC1 or IC2 on RM-179 board trouble

Protecting operations: When the sub error message is "**SY2**", enters the protection mode.
When it is except above, displays only this error.

ERROR-93 CPU INITIALIZE ERROR (CPU INITIALIZE ERROR)

Description: Abnormality was detected in the communication between SV CPU (SS-83 board) and DT MPU or DRUM CPU (SS-83 board).

Sub error messages and Detecting conditions:

DT: When the communication with DT MPU (IC2700 on SS-83 board) at power-on is in abnormal state.

DRUM: When the communication with DRUM CPU (IC314 on SS-83 board) at power-on is in abnormal state.

Possible causes:

DT: IC2700 and its peripheral circuit on SS-83 board trouble

DRUM: IC314 and its peripheral circuit on SS-83 board trouble

Protecting operation: Prohibits the cassette insertion.

ERROR-95 OTHERS NV-RAM ERROR (OTHERS NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM on RM-179 board was detected.

Sub error message and Detecting condition:

REMOTE-2 DATA RESET: When the REMOTE-2 (50-pin) setting data in an NV-RAM on RM-179 board is abnormal and the setting data is reset.

Possible cause: IC1 or IC2 on RM-179 board trouble

Protecting operation: Resets the 50-pin parallel remote (REMOTE-2) setting data to the factory setting.

ERROR-96 SY NV-RAM ERROR (SY NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM (IC710 on SS-83 board) for the system control system was detected.

Sub error messages and Detecting conditions:

CURRENT SETUP: When the data error occurs in the setup menu current memory area during the data write or read .

SETUP BANK1: When the data error occurs in the setup menu bank 1 memory area during the data write or read.

SETUP BANK2: When the data error occurs in the setup menu bank 2 memory area during the data write or read.

SETUP BANK3: When the data error occurs in the setup menu bank 3 memory area during the data write or read.

SETUP BANK4: When the data error occurs in the setup menu bank 4 memory area during the data write or read.

ID CODE: When the data error occurs in the ID code memory area during the data write or read.

CALENDAR CLOCK: When the calendar/clock function was stopped.

Possible causes:

- NV-RAM (IC710 on SS-83 board) trouble
- Address decoder (IC1107 on SS-83 board) trouble
- Backup battery inside NV-RAM is out of life

Protecting operations: When the error occurs in setting data of the setup menu, resets those data to the factory settings.
When the error occurs in ID data, resets the data to 00 00 00 00.
When the error occurs at the calendar/clock function, resets the date and time data to ’96 11 01 00 00 00 (= Year, Month, Day, Hour, Minute, Second).

ERROR-97 SV NV-RAM ERROR (SV NV-RAM)

Description: The abnormal operation of an NV-RAM (MS-58 board) for the servo system was detected.

Detecting condition: When the checksum of NV-RAM data does not coincide during activation.

Sub error message: None

Possible cause: NV-RAM (IC9 on MS-58 board) trouble

Protecting operation: Enters the protection mode.

ERROR-98 RF NV-RAM ERROR (RF NV-RAM ERROR)

Description: The abnormal operation of an NV-RAM (EQ-75C, DM-89, or TBC-23A board) for RF system was detected.

Sub error messages and Detecting conditions:

EQ: When the error occurs in an NV-RAM (IC900 on EQ-75C board) during the data write or read.

DM: When the error occurs in an NV-RAM (IC908 on DM-89 board) during the data write or read.

TBC: When the error occurs in an NV-RAM (IC200 on TBC-23A board) during the data write or read.

Possible causes: Trouble of an NV-RAM indicated by sub error message

Protecting operation: None

ERROR-99 INTERNAL INTERFACE ERROR 2 (INTERNAL I/F 2)

Description: Abnormality was detected in the communication between SYS2 CPU (SS-83 board) and SERVO CPU (SS-83 board) or MPU (on EQ-75C, DM-89, TBC-23A, or SDI-41C board) or FL (level meter module).

Sub error messages and Detecting conditions:

SV: When the SERVO CPU (IC103 on SS-83 board) initialization at power-on is in abnormal state.

EQ: When the communication with EQ-75C board's MPU (IC908) is in abnormal state.

DM: When the communication with DM-89 board's MPU (IC906) is in abnormal state.

TBC: When the communication with TBC-23A board's MPU (IC202) is in abnormal state.

SDI: When the communication with SDI-41C board's MPU (IC455) is in abnormal state.

FL: When the communication with FL (level meter module) is in abnormal state.

Possible causes:

SV:
- DIP switch (S101 on SS-83 board) setting defect
- Common RAM (IC2503 on SS-83 board) trouble
- Servo system (IC100 series or IC300 series on SS-83 board) trouble

EQ:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- Interface buffers (IC901, 902, 905 on EQ-75C board) trouble
- EQ-75C board's MPU (IC908) trouble

DM:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- DM-89 board's MPU (IC906) trouble

TBC:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- TBC-23A board's MPU (IC202) trouble

SDI:
- MPU control interface circuit (IC2102, 2107, 2108 on SS-83 board) trouble
- SDI-41C board's MPU (IC455) trouble

FL:
- Cable (between FP-117 board and level meter module) connection defect or disconnection
- Level meter module trouble

Protecting operations: When the sub error message is "**SV**", enters the protection mode.
When it is except above, displays only this error.

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Section 4
Maintenance Mode

4-1. Overview of Maintenance Mode

This unit has the maintenance mode that is useful during maintenance and trouble diagnosis.
This maintenance mode consists of the three modes below. The contents of the maintenance mode are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
(To superimpose the contents of the maintenance mode, set the CHARACTER switch on the sub control panel to ON.)

```
    MAINTENANCE MODE

*M0  :  TAPE MAINTENANCE
 M2  :  ERROR LOGGER
 M3  :  OTHERS
```

Note

The typeface of characters displayed on the video monitor differs from the actual one.

(Mode screen during activation of maintenance mode)

M0 : TAPE MAINTENANCE ..... (Section 4-2)

This mode is used for maintenance of a VTR part.

```
  TAPE MAINTENANCE MODE

*C0  :   SERVO/DT     CHECK
 C1  :       RF       CHECK
 C2  :  AUDIO/VIDEO   CHECK
 C3  :  BETACAM PB    CHECK
 A0  :   SERVO/DT    ADJUST
 A1  :       RF      ADJUST
 A2  :  AUDIO/VIDEO  ADJUST
 A3  :  BETACAM PB   ADJUST
 A4  :  MECHANISM    ADJUST
 A5  :  LTC REC      ADJUST
```

M2 : ERROR LOGGER ..... (Section 4-3)

This mode is used to display the record of errors (error logging) that occur in this unit.

```
      ERROR LOGGER
        (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR            ON
 WARNING               ON
 CONDITION             ON


   '98 07 03  09:23:00
```

Note

The display on the left is one of the displayed examples.

M3 : OTHERS ..... (Section 4-4)

This mode is used for checking the others.

```
       M3:OTHERS

*M30:ROM VERSION
 M31:SERIAL NUMBER
 M32:RS-232C STATUS
 M35:MEMORY CHECK
 M36:HOUR METER RESET
 M37:METER HEAD ROOM
 M39:50PIN DATA ASSIGN
 M3F:MEMORY CARD UTILITY
```

Buttons and Switches for Operation

The main buttons and switches related to the operation of maintenance mode are as follows: The ordinary functions of these buttons and switches and how to use them are described below.

① Time data display area
The time data display area displays the menu (mode) No., menu title, selection item, status, or data. The menu (mode) No. or selection item block blinks while the menu (mode) or selection item is specified (not including the servo menu in the TAPE maintenance mode). For manual adjustment, the data block blinks. In the state where the tape operation (PB, REC, F FWD, and REW) can be performed, the time data display area functions as an ordinary time counter.
There is a menu (mode) that contains insufficient information displayed in the time data display area. Since the information displayed on the superimpose picture is easier to operate and check, usually use a video monitor.

② MENU button
Press this button in the maintenance mode to return to the screen (state) preceding by one step.
The maintenance mode is terminated if this button is pressed when the mode screen is displayed (mode No. M0, M2, or M3 blinks in a time data display area).

③ SET button
Press this button in the maintenance mode to select or execute the menu (mode) selected using a ⑧ search dial.
The maintenance mode can be activated when this SET button is pressed while pressing the ④ CTL/TC/UB button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-83 board set to ON (upper).

④ CTL/TC/UB button
The maintenance mode can be activated when the ③ SET button is pressed while pressing this button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-83 board set to ON (upper).

⑤ RESET button
Press this button in the error logger mode to erase the recorded error log.

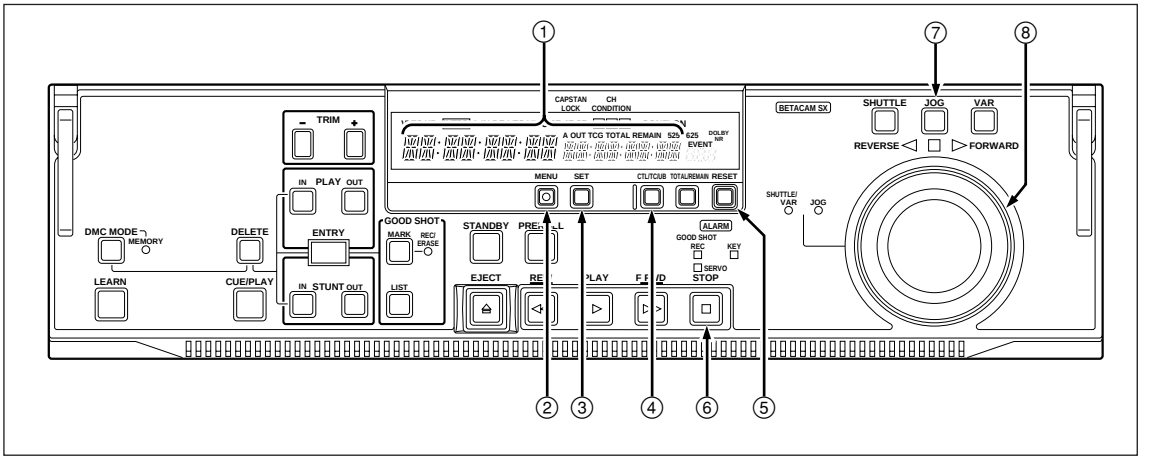
⑥ STOP button
The data value of an electronic volume control can be displayed only while the STOP button is pressed in RF system automatic adjustment menu.

⑦ JOG button
The ⑧ search dial enters the JOG mode when this button is pressed (the lamp does not light in this case). The data value or setting can be changed when the ⑧ search dial is turned while pressing this button.

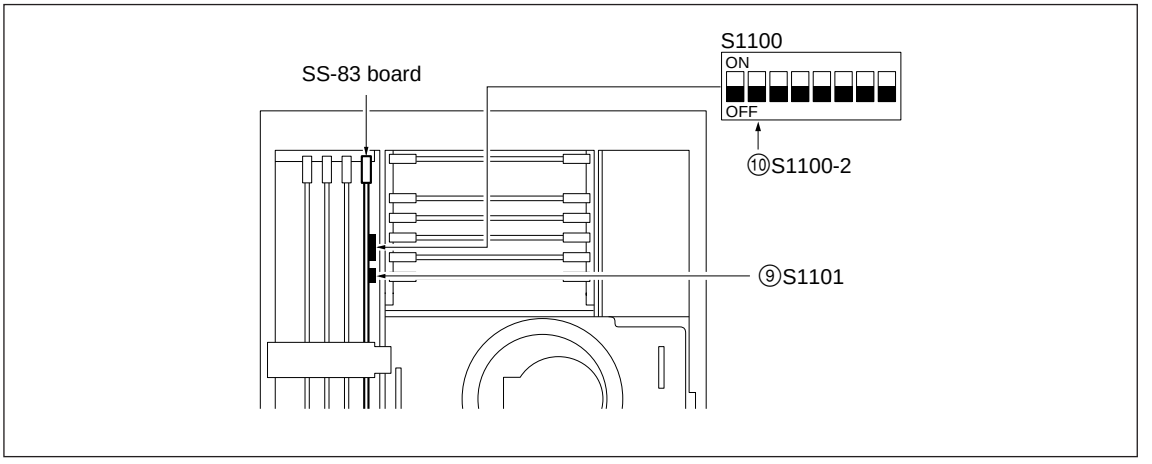
⑧ Search dial
Turn the search dial to specify the menu (mode) or selection item. An "∗" mark moves on the video monitor. In a time data display area, the display is replaced and the specified item blinks. ("JOG DIAL" is displayed on the video monitor.)
The data value or setting can be changed when the search dial is turned while pressing the ⑦ JOG button.

⑨ S1101/SS-83 board: Maintenance mode start switch (MAINTE MODE START)
Press this switch to activate the maintenance mode.

⑩ S1100-2/SS-83 board: Maintenance mode access approval switch (MAINTE MODE Access)
Set this switch to ON (upper) in advance when activating the maintenance mode by the button operation on the control panel.



Lower Control Panel



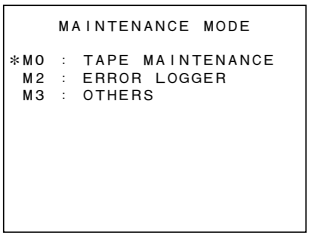
Location of Switches on SS-83 Board

Note

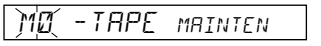
Remove the upper lid referring to Section 2-3-1 when operating the switches on the SS-83 board. Change the setting of DIP switch S1100 with the power switch set to OFF.

Activating the Maintenance Mode

1. Check that the video monitor is connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
2. Press the ⑨ S1101 switch (on the SS-83 board).
3. The mode screen in the maintenance mode is superimposed on the video monitor.
   In a ① time data display area, “M0-TAPE MAINTEN” is displayed and the M0 block blinks.



Video Monitor



Time Data Display Area

Activating the Maintenance Mode from Control Panel

The maintenance mode can be activated by the operation below when the S1100-2 switch (on the SS-83 board) is set to ON (upper).

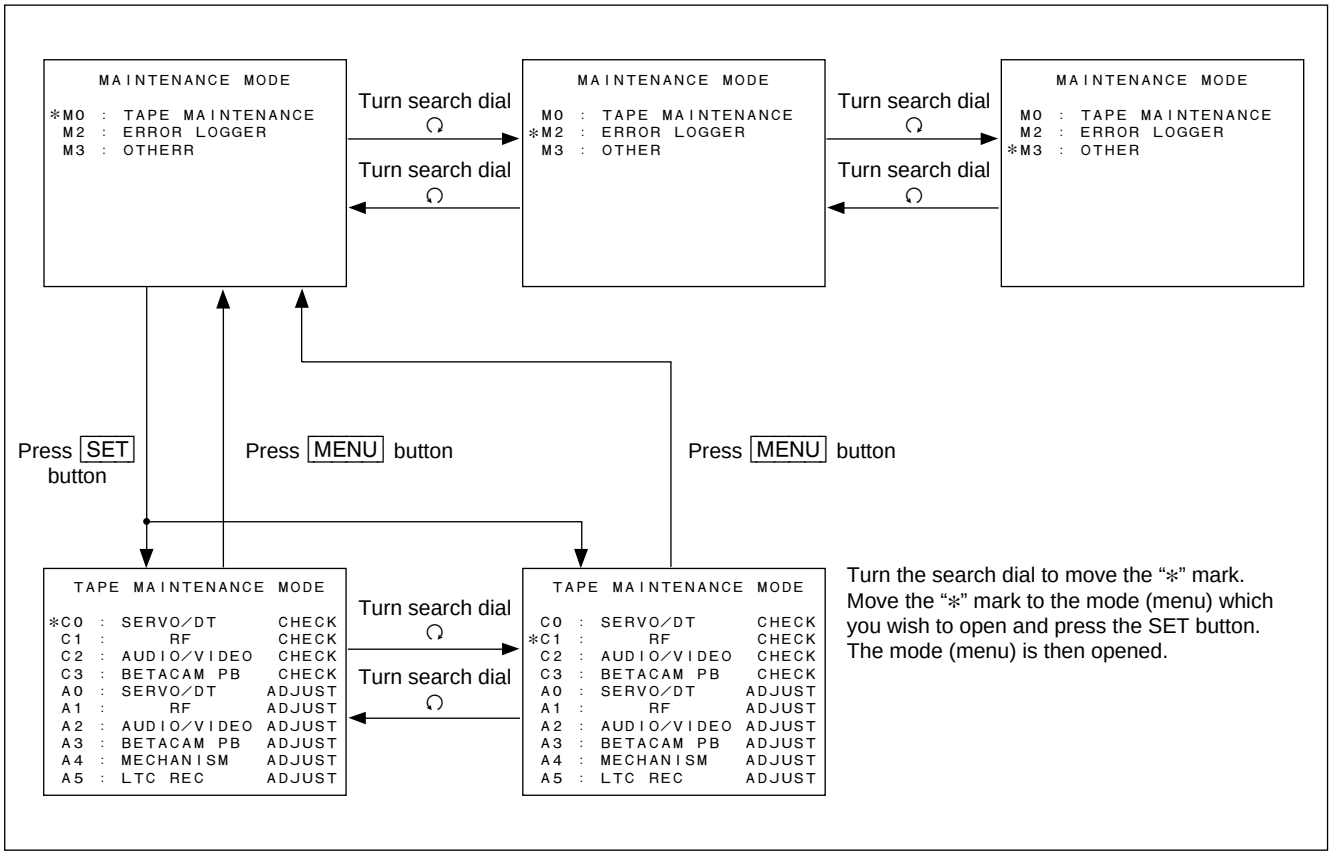
1. Press the ② MENU button once.
   (Execute the setup menu mode from the operation mode.)
2. Press the ③ SET button while pressing the ④ CTL/TC/UB button.
   (Execute the maintenance mode from the setup menu mode.)
3. The mode screen in the maintenance mode is displayed on the video monitor.

Terminating the Maintenance Mode

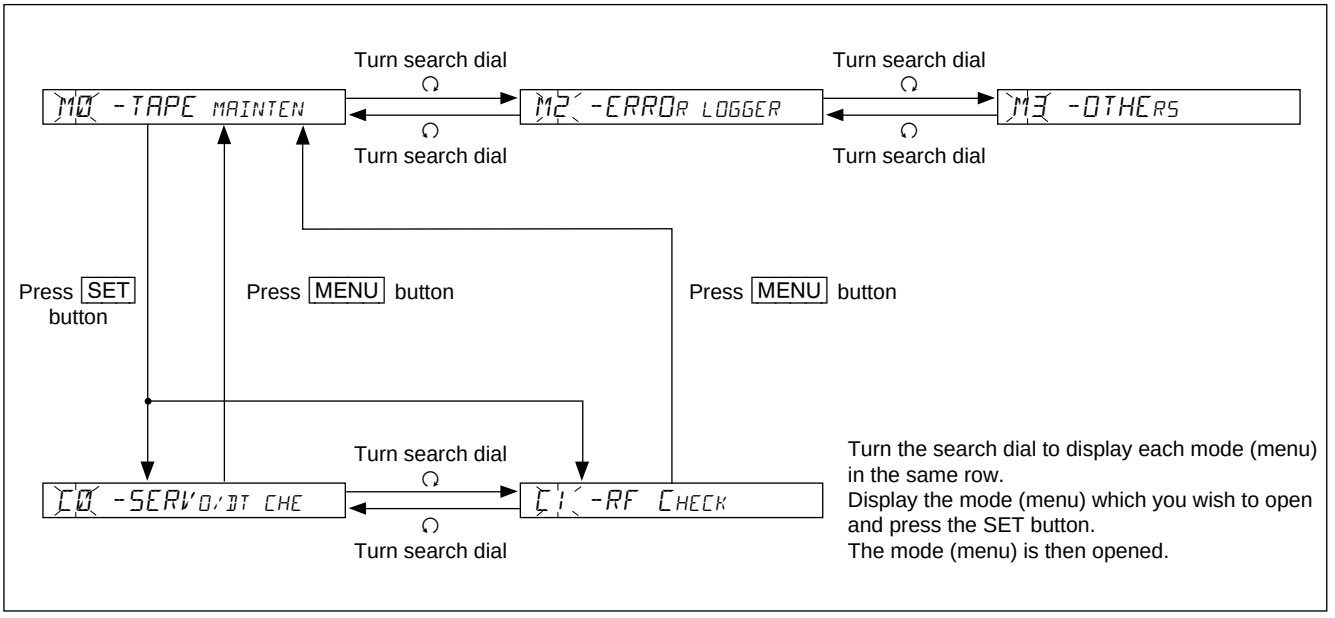
1. Press the ② MENU button several times to display the mode screen on the video monitor.
   The selected mode No. and title are displayed in a time counter.
2. Press the ② MENU button again to terminate the maintenance mode.

Specifying the Menu (Mode) and Item

How to specify the menu (mode) and item using the search dial (JOG mode) is described below with the mode selection given as an example.


MAINTENANCE MODE
*M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
M3 : OTHERR
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
*M2 : ERROR LOGGER
M3 : OTHER
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
*M3 : OTHER
Turn search dial
Turn search dial
Turn search dial
Turn search dial
Press SET button
Press MENU button
Press MENU button
TAPE MAINTENANCE MODE
*C0 : SERVO/DT CHECK
C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
C3 : BETACAM PB CHECK
A0 : SERVO/DT ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
A5 : LTC REC ADJUST
TAPE MAINTENANCE MODE
C0 : SERVO/DT CHECK
*C1 : RF CHECK
C2 : AUDIO/VIDEO CHECK
C3 : BETACAM PB CHECK
A0 : SERVO/DT ADJUST
A1 : RF ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
A5 : LTC REC ADJUST
Turn search dial
Turn search dial
Turn the search dial to move the "*" mark.
Move the "*" mark to the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in Superimpose Picture


M0 -TAPE MAINTEN
M2 -ERROR LOGGER
M3 -OTHERS
Turn search dial
Turn search dial
Turn search dial
Turn search dial
Press SET button
Press MENU button
Press MENU button
C0 -SERVO/DT CHE
C1 -RF CHECK
Turn search dial
Turn search dial
Turn the search dial to display each mode (menu) in the same row.
Display the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in Time Data Display Area

4-2. TAPE Maintenance Mode (M0)

4-2-1. Overviews

The TAPE maintenance mode is used for the maintenance and check.
This unit has the ten submodes below.

```
  TAPE MAINTENANCE MODE

*C0 :   SERVO/DT     CHECK
 C1 :       RF       CHECK
 C2 : AUDIO/VIDEO    CHECK
 C3 : BETACAM PB     CHECK
 A0 :   SERVO/DT    ADJUST
 A1 :       RF      ADJUST
 A2 : AUDIO/VIDEO   ADJUST
 A3 : BETACAM PB    ADJUST
 A4 : MECHANISM     ADJUST
 A5 : LTC REC       ADJUST
```

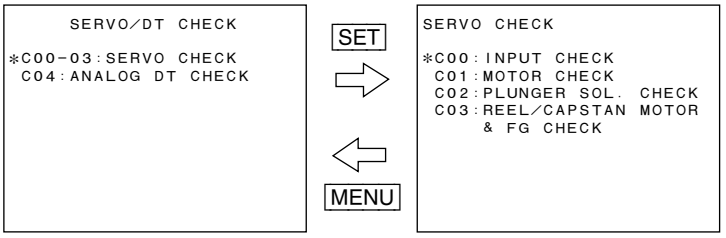
TAPE Maintenance Mode

C0: SERVO/DT CHECK

This submode is used to check the servo and analog DT systems.

C00-03: SERVO CHECK

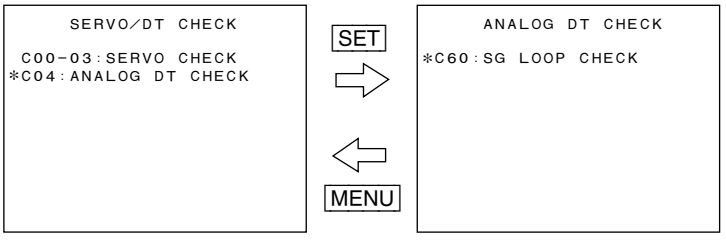
This mode is used to check the servo system. For more details, refer to Section 4-2-2 (on page 4-12).



Title	Page	Description
C00 : INPUT CHECK	—	Check menu of sensors (not including a part of sensors)
C000 : CASSETTE SW	4-13	Checks the cassette tab and REC inhibit sensors.
C001 : CASSETTE COMP. SW	4-14	Checks the cassette-in and cassette size sensors.
C002 : TOP/END SENSOR	4-15	Checks the tape top and tape end sensors.
C003 : DEW SENSOR	4-16	Checks the dew condensation sensors.
C01 : MOTOR CHECK	—	Check menu of motors (except a fan motor) and partial sensors
C010 : S REEL MOTOR	4-17	Checks the S reel motor.
C011 : T REEL MOTOR	4-17	Checks the T reel motor.
C012 : THREADING MOTOR	4-18	Checks the threading motor and threading/unthreading end sensors.
C013 : CASSETTE COMP. MOTOR	4-19	Checks the cassette compartment motor and cassette-down sensors.
C014 : CAPSTAN MOTOR	4-20	Automatically checks the capstan motor.
C015 : DRUM MOTOR	4-21	Automatically checks the drum motor.
C016 : REEL POSITION MOTOR	4-22	Checks the reel shift motor and reel position sensors.
C02 : PLUNGER SOL. CHECK	—	Check menu of solenoids
C020 : PINCH ROLLER	4-23	Checks the pinch roller solenoid.
C021 : S REEL BRAKE	4-24	Checks the S reel brake solenoid.
C022 : T REEL BRAKE	4-24	Checks the T reel brake solenoid.
C023 : CLEANING ROLLER	4-25	Checks the cleaning roller solenoid.
C03 : REEL/CAPSTAN MOTOR & FG CHECK	4-26	Continuous check menu of reel and capstan motors

C04: ANALOG DT CHECK

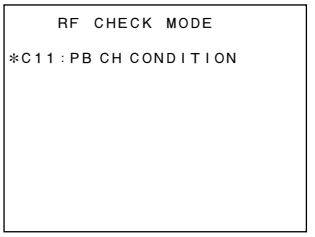
This mode is used to check the analog DT system. For more details, refer to Section 4-2-3 (on page 4-27).



Title	Page	Description
C060 : SG LOOP CHECK	4-27	Checks the feedback loop of the strain gauge for analog Betacam playback.

C1 : RF CHECK

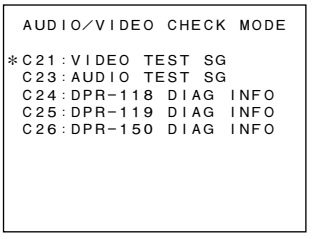
This submode is used to check the RF system.
For more details, refer to Section 4-2-4 (on page 4-28).



Title	Page	Description
C11 : PB CH CONDITION	4-28	Checks the error condition for each PB head (A1, A2, A5, A6, B1, B2, B5 and B6) in a drum.

C2 : AUDIO/VIDEO CHECK

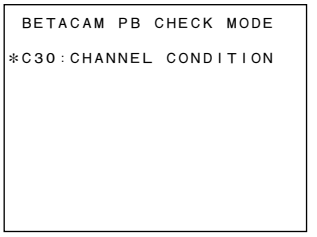
This submode is used to check the audio and video systems.
For more details, refer to Section 4-2-5 (on page 4-31).



Title	Page	Description
C21 : VIDEO TEST SG	4-32	Sets the video test signal generator incorporated into this unit.
C23 : AUDIO TEST SG	4-33	Sets the audio test signal generator incorporated into this unit.
C24 : DPR-118 DIAG INFO	4-33	Displays the result of self diagnostic in DPR-118 board.
C25 : DPR-119 DIAG INFO	4-35	Displays the result of self diagnostic in DPR-119 board. (Used for BKNW-118.)
C26 : DPR-150 DIAG INFO	4-36	Display the result of self diagnostic in DPR-150 board. (Used for BKNW-124.)

C3 : BETACAM PB CHECK

This submode is used to check the PB system based on a Betacam/Betacam SP format.
For more details, refer to Section 4-2-6 (on page 4-38).



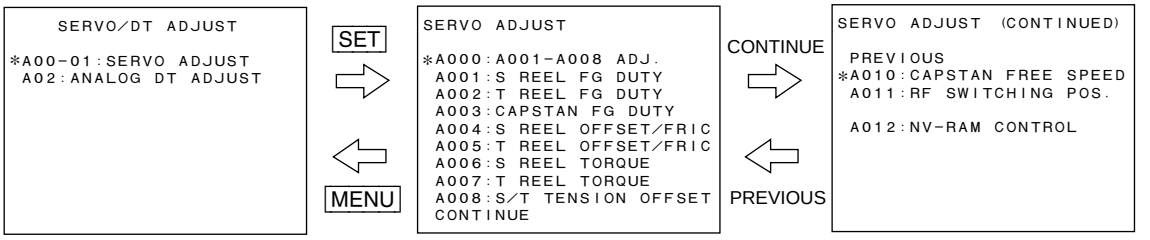
Title	Page	Description
C30 : CHANNEL CONDITION	4-38	Checks the RF level condition for each video channel (Y and C) to be played back.

A0: SERVO/DT ADJUST

This submode is used to adjust the servo and analog DT system.

A00-01: SERVO ADJUST

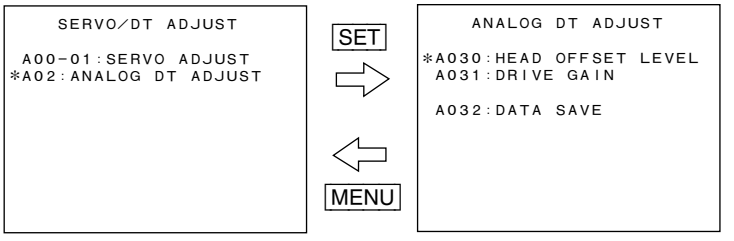
This mode is used to adjust the servo system. For more details, refer to Section 4-2-7 (on page 4-40).



Title	Page	Description
A000 : A001-A008 ADJ.	4-41	Continuously executes the automatic adjustment menus (A001 to A008).
A001 : S REEL FG DUTY	4-42	Automatically adjusts the duty ratio of an S reel FG.
A002 : T REEL FG DUTY	4-42	Automatically adjusts the duty ratio of a T reel FG.
A003 : CAPSTAN FG DUTY	4-42	Automatically adjusts the duty ratio of a capstan FG.
A004 : S REEL OFFSET/FRIC	4-42	Automatically adjusts the S reel offset and friction.
A005 : T REEL OFFSET/FRIC	4-42	Automatically adjusts the T reel offset and friction.
A006 : S REEL TORQUE	4-42	Automatically adjusts the S reel torque.
A007 : T REEL TORQUE	4-42	Automatically adjusts the T reel torque.
A008 : S/T TENSION OFFSET	4-42	Automatically adjusts the tension regulator offset values on the S and T sides.
A010 : CAPSTAN FREE SPEED	4-43	Automatically adjusts the capstan free speed.
A011 : RF SWITCHING POS.	4-44	Automatically adjusts the RF switching position.
A012 : NV-RAM CONTROL	4-46	Saves the adjustment data in a servo system.

A02: ANALOG DT ADJUST

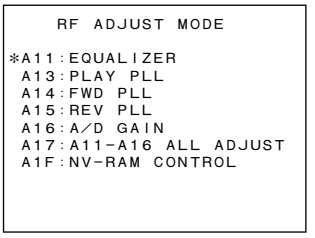
This mode is used to adjust the analog DT system. For more details, refer to Section 4-2-8 (on page 4-47).



Title	Page	Description
A030 : HEAD OFFSET LEVEL	4-47	Adjusts the offset level of an analog Betacam PB head.
A031 : DRIVE GAIN	4-49	Adjusts the drive gain of an analog DT system.
A032 : DATA SAVE	4-51	Saves the adjustment data in an analog DT system.

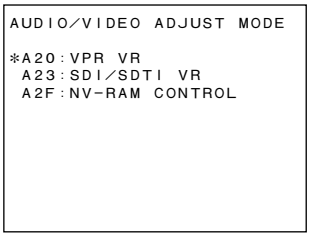
A1 : RF ADJUST

This submode is used to adjust the RF system.
For more details, refer to Section 4-2-9 (on page 4-52).



Title	Page	Description
A11 : EQUALIZER	4-52	Automatically adjusts the PB head playing back level and PB equalizer (for A1, A2, A5, A6, B1, B2, B5 and B6 channels).
A13 : PLAY PLL	4-52	Automatically adjusts the PB PLL circuit (in the PLAY mode).
A14 : FWD PLL	4-52	Automatically adjusts the PB PLL circuit (in the FORWARD mode).
A15 : REV PLL	4-52	Automatically adjusts the PB PLL circuit (in the REVERSE mode).
A16 : A/D GAIN	4-52	Automatically adjusts the gain when a PB RF signal is converted from analog to digital.
A17 : A11-A16 ALL ADJUST	4-57	Continuously executes the above automatic adjustment menus A11 to A16.
A1F : NV-RAM CONTROL	4-59	Saves the adjustment data in an RF system.

A2 : AUDIO/VIDEO ADJUST



This submode is used to adjust the audio and video systems.
For more details, refer to Section 4-2-10 (on page 4-60).

Title	Page	Description
A20 : VPR VR	4-61	Adjusts the reference signal system and analog video output system on the VPR-47 board.
A23 : SDI/SDTI VR	4-62	Adjustment menu for the SDI and SDTI output interfaces
A231 : SDI ENC1 VCO	4-62	Automatically adjusts the SDI output interface.
A232 : SDI ENC2 VCO	4-62	Automatically adjusts the SDI output interface.
A234 : SDTI ENC VCO	4-62	Automatically adjusts the SDTI (SX) output interface. (Used for BKNW-118.)
A235 : SDTI-CP ENC VCO	4-62	Automatically adjusts the SDTI-CP output interface. (Used for BKNW-124.)
A2F : NV-RAM CONTROL	4-64	Saves the adjustment data in audio and video systems.

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A3 : BETACAM PB ADJUST

This submode is used to adjust the PB system based on a Betacam/Betacam SP format.
For more details, refer to Section 4-2-11 (on page 4-65).

```
BETACAM PB ADJUST MODE

*A30:EQ VR
 A32:DM VR 1
 A33:DM VR 2
 A34:DM VR 3
 A35:DM VR 4
 A36:DM VR 5
 A37:TBC VR
 A3F:NV-RAM CONTROL
```

Title	Page	Description
A30 : EQ VR	4-65	Adjusts the gain of an analog Betacam PB RF amplifier (EQ-75C board).
A32 : DM VR 1	4-65	Adjusts the frequency characteristics of a primary cosine equalizer (DM-89 board).
A33 : DM VR 2	4-66	Adjusts the frequency characteristics of a secondary cosine equalizer (main) (DM-89 board).
A34 : DM VR 3	4-66	Adjusts the frequency characteristics of a secondary cosine equalizer (sub) (DM-89 board).
A35 : DM VR 4	4-66	Adjusts the guard band width and sets the DC offset level of an over-modulation compensation circuit (DM-89 board).
A36 : DM VR 5	4-66	Adjusts the threshold level of a dropout and sets the threshold level of an RF envelope (DM-89 board).
A37 : TBC VR	4-66	Sets the read clock timing and the data of a PB VISC phase detection circuit (TBC-23A board).
A3F : NV-RAM CONTROL	4-67	Saves the adjustment data in an analog Betacam PB system.

A4 : MECHANISM ADJUST

This submode is used for adjusting the mechanism part.
For more details, refer to Section 4-2-12 (on page 4-68).

```
    MECHANISM ADJUST

*A40:PATH MODE SEL
```

Title	Page	Description
A40 : PATH MODE SEL	4-68	Sets the tape PB mode. (Used for tape transport adjustment.)

A5 : LTC REC ADJUST

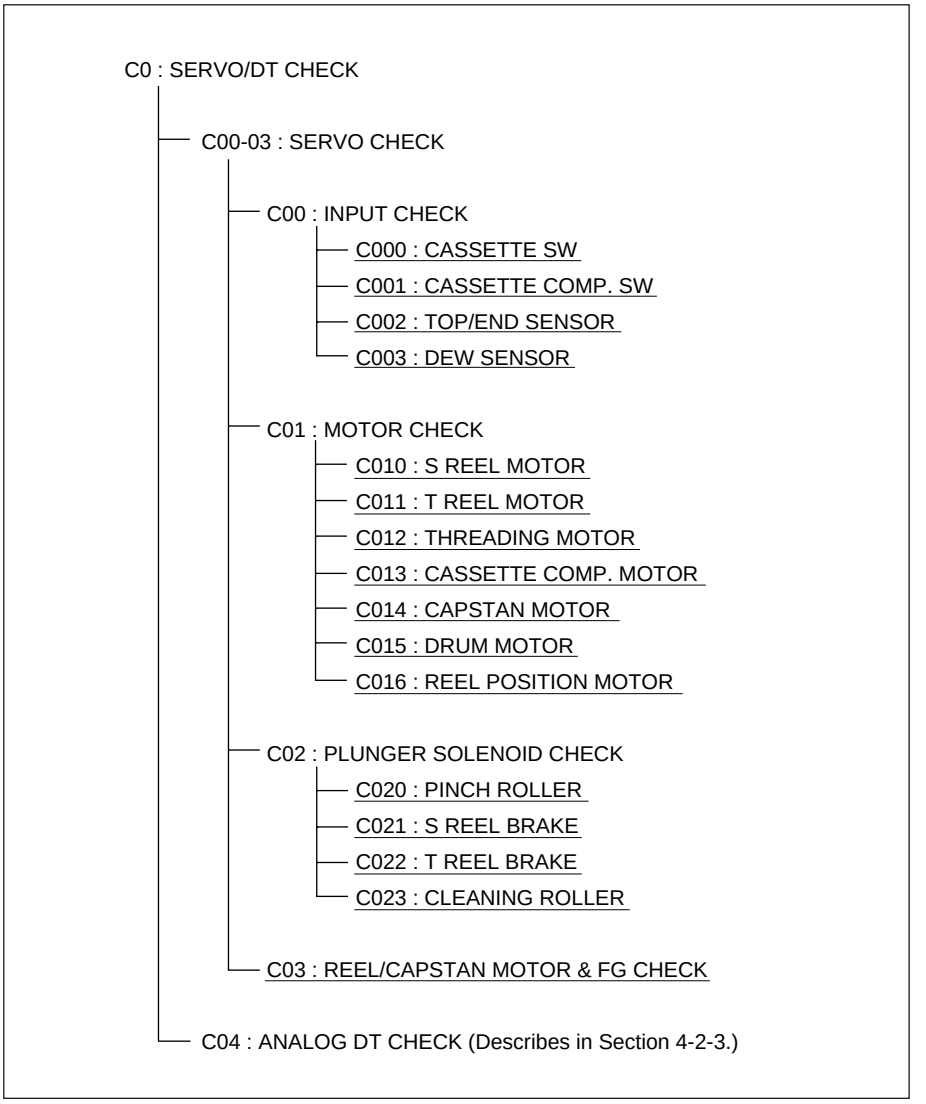
This mode is used for adjusting the shot mark recording circuit.
For more details, refer to Section 4-2-13 (on page 4-69).

4-2-2. SERVO CHECK Mode (C00-03)

The C00-03 : SERVO CHECK mode is used to check the servo system. The underlined menus and submenus in the menu tree below are described next.

Note

In the servo check mode, only the menu number is displayed in the time data display area. (C00-03 is displayed as “C00”.)


C0 : SERVO/DT CHECK
C00-03 : SERVO CHECK
C00 : INPUT CHECK
C000 : CASSETTE SW
C001 : CASSETTE COMP. SW
C002 : TOP/END SENSOR
C003 : DEW SENSOR
C01 : MOTOR CHECK
C010 : S REEL MOTOR
C011 : T REEL MOTOR
C012 : THREADING MOTOR
C013 : CASSETTE COMP. MOTOR
C014 : CAPSTAN MOTOR
C015 : DRUM MOTOR
C016 : REEL POSITION MOTOR
C02 : PLUNGER SOLENOID CHECK
C020 : PINCH ROLLER
C021 : S REEL BRAKE
C022 : T REEL BRAKE
C023 : CLEANING ROLLER
C03 : REEL/CAPSTAN MOTOR & FG CHECK
C04 : ANALOG DT CHECK (Describes in Section 4-2-3.)

Menu Tree of Servo System Check Mode

Note

When the unit has a cassette tape, the cassette tape is automatically ejected on shifting to any lower-level menu from the C00-03 : SERVO CHECK menu.

C000 : CASSETTE SW

This submenu checks the functions of six cassette tab sensors and three REC inhibit sensors (switches).

```
SERVO CHECK
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH  8:L REC INH
 9:L SP INH
                  7  123  9
 SW 987654321        4 5  8
    000000000         6
```

(Ex.: When pushing the switch ⑦)

```
SERVO CHECK
 INPUT CHECK

C000:CASSETTE SW
 1:REEL HUB   2:METAL/OX
 3:THICKNESS  4:SPARE
 5:SPARE      6:DGTL/ANLG
 7:S REC INH  8:L REC INH
 9:L SP INH
                  7  123  9
 SW 987654321        4 5  8
    001000000         6
```

Checking

Be sure to check each sensor (switch).

(1) Push a sensor (switch) with a finger, and hold it.
- Check the superimposed display to see that a character below the corresponding SW number changes from “0” to “1”.

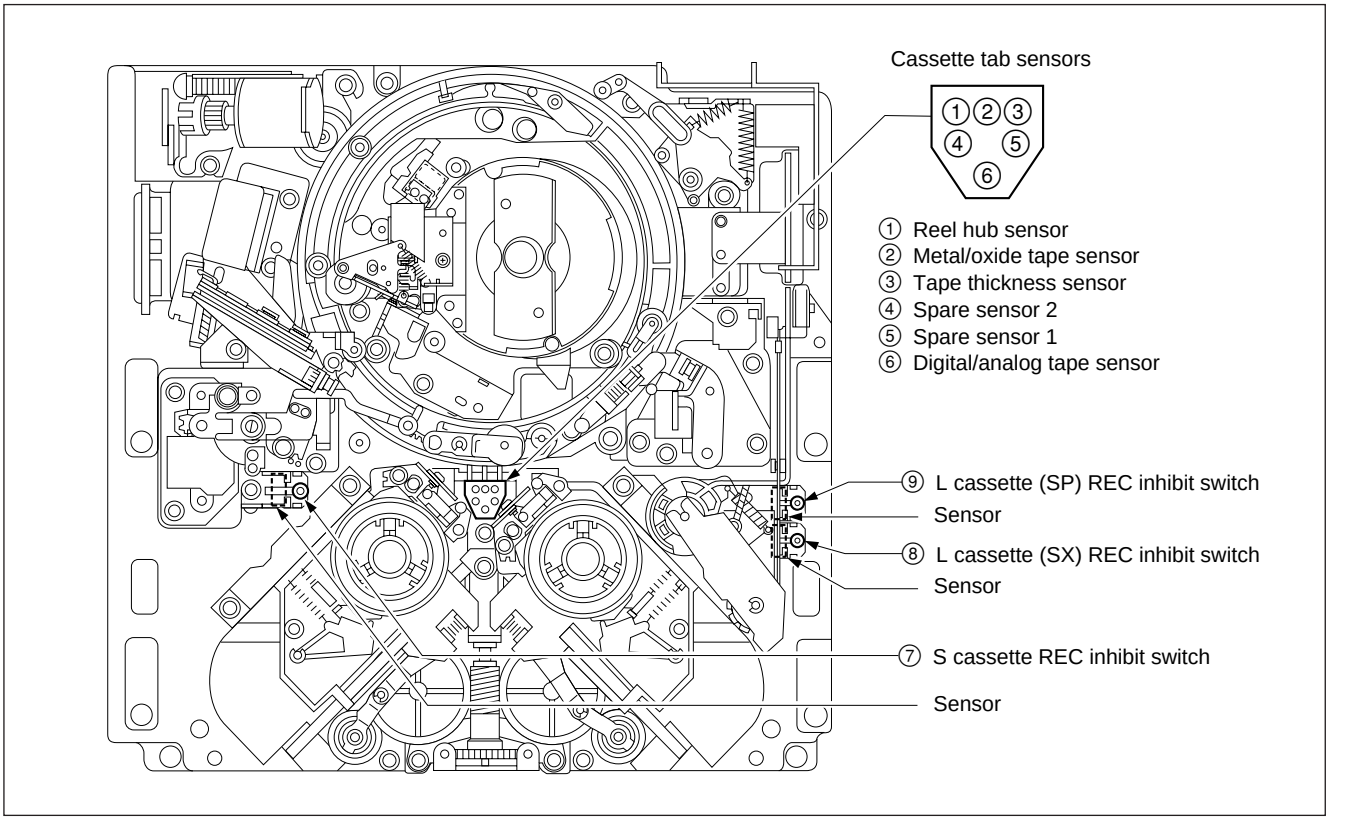
(2) Release the sensor (switch).
- Check the superimposed display to see that above-mentioned “1” returns to “0”.

(3) To finish the check, press the MENU button once.

In case of NG

When any cassette tab sensor (① to ⑥) is NG:
- Check the corresponding sensor on the PTC-59 board.
- Check the corresponding sensor input port of MPU (IC1 on the MS-58 board).

When any REC inhibit sensor (⑦ to 9) is NG:
- Check the corresponding sensor on the MS-58 board.
- Check the corresponding sensor input port of MPU (IC1 on the MS-58 board).


Cassette tab sensors
① Reel hub sensor
② Metal/oxide tape sensor
③ Tape thickness sensor
④ Spare sensor 2
⑤ Spare sensor 1
⑥ Digital/analog tape sensor
⑨ L cassette (SP) REC inhibit switch Sensor
⑧ L cassette (SX) REC inhibit switch Sensor
⑦ S cassette REC inhibit switch Sensor

Locations of Sensors (Switches)

C001 : CASSETTE COMP. SW

This submenu checks the functions of three sensors (switches) in a compartment.

```
SERVO CHECK
 INPUT CHECK

C001:CASSETTE COMP. SW
 SW1:CASSETTE IN SW 1
 SW2:CASSETTE IN SW 2
 SW3:LARGE CASSETTE SW

      3  1      2
```

Checking

Be sure to check each sensor (switch). These switches interlock with sensors.

Switch	Sensor
SW1 : Cassette-in switch 1	Cassette-in sensor (L)
SW2 : Cassette-in switch 2	Cassette-in sensor (R)
SW3 : L cassette detection switch	Cassette size sensor

(Ex.)

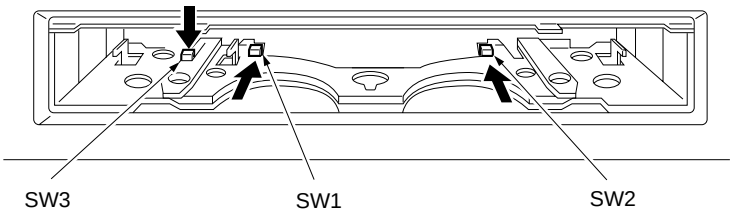
```
SERVO CHECK
 INPUT CHECK

C001:CASSETTE COMP. SW
 SW1:CASSETTE IN SW 1
 SW2:CASSETTE IN SW 2
 SW3:LARGE CASSETTE SW

      3  □      2
```

(1) Push up the cassette door to the inside with one finger, and hold it.
(2) Push a switch in the direction indicated by the allow with another finger, and hold it.
  • Check the superimposed display to see that the corresponding SW number changes to "□".
(3) Release the switch.
  • Check to see that above-mentioned "□" returns to the former switch number.
(4) To finish the check, press the MENU button once.

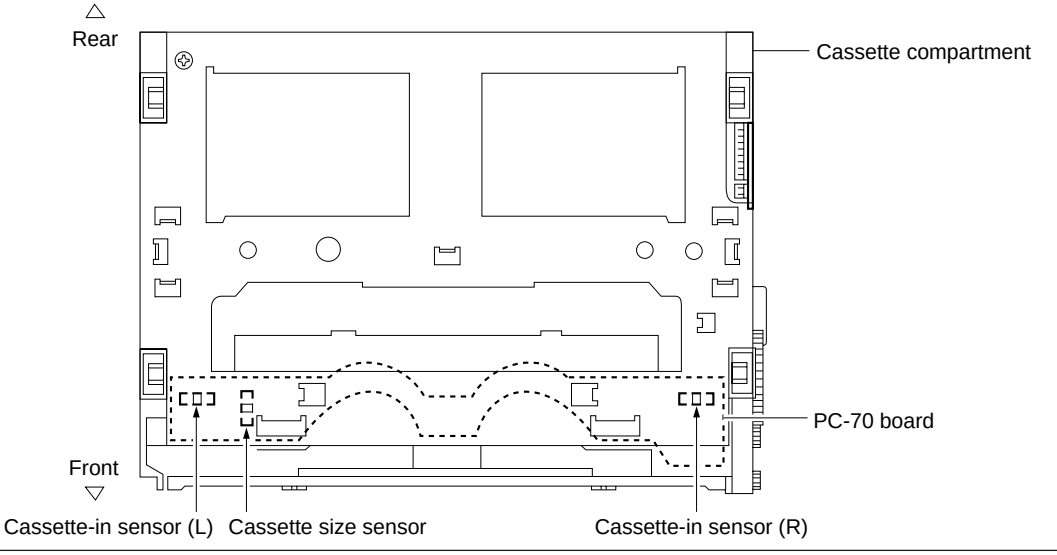
In case of NG

• Check the corresponding sensor on the PC-70 board.
• Check the corresponding sensor input port of MPU (IC1 on the MS-58 board).

Push the cassette window up manually. Push the switch in the direction of thick arrow.



Locations of Switches in Compartment Block



Locations of Sensors

C002 : TOP/END SENSOR

This submenu checks the functions of a tape top sensor and a tape end sensor.

```
SERVO CHECK
 INPUT CHECK

C002:TOP/END SENSOR

   END          TOP
 SENSOR       SENSOR

   OFF          OFF
```

Checking

Be sure to check each sensor.

(1) Approach a metallic screwdriver to a sensor.
- Check the superimposed display to see that a character string below the corresponding sensor name changes from “OFF” to “ON!”.

Note

Do not contact the screwdriver with each sensor.

(2) Distance the screwdriver from the sensor.
- Check to see that above-mentioned “ON!” returns to “OFF”.

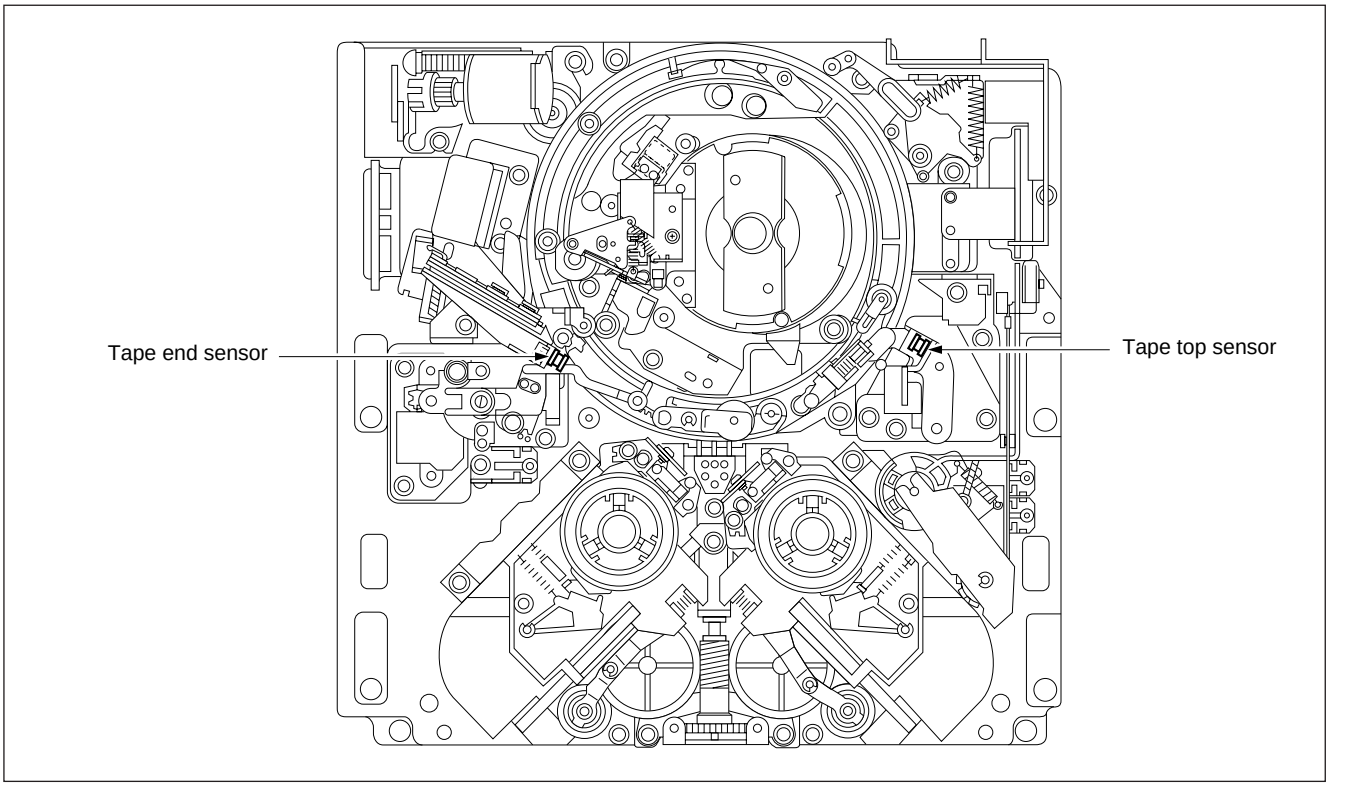
(3) To finish the check, press the MENU button once.

(Ex.)

```
SERVO CHECK
 INPUT CHECK

C002:TOP/END SENSOR

   END          TOP
 SENSOR       SENSOR

   OFF          ON!
```

In case of NG

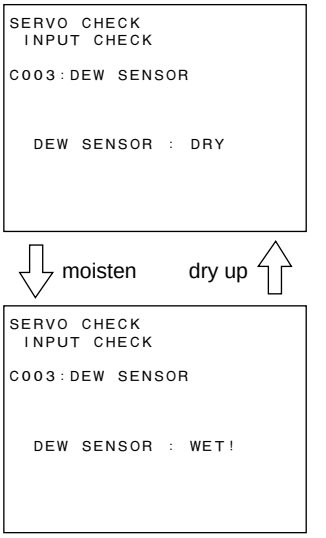
- Check the sensor itself.
- Check the oscillator and detection circuit on the MS-58 board for sensors.
- Check the corresponding sensor input port (IC115 on the SS-83 board).



Locations of Tape Top and Tape End Sensors

C003 : DEW SENSOR

This submenu checks the function of a dew condensation sensor.



Checking

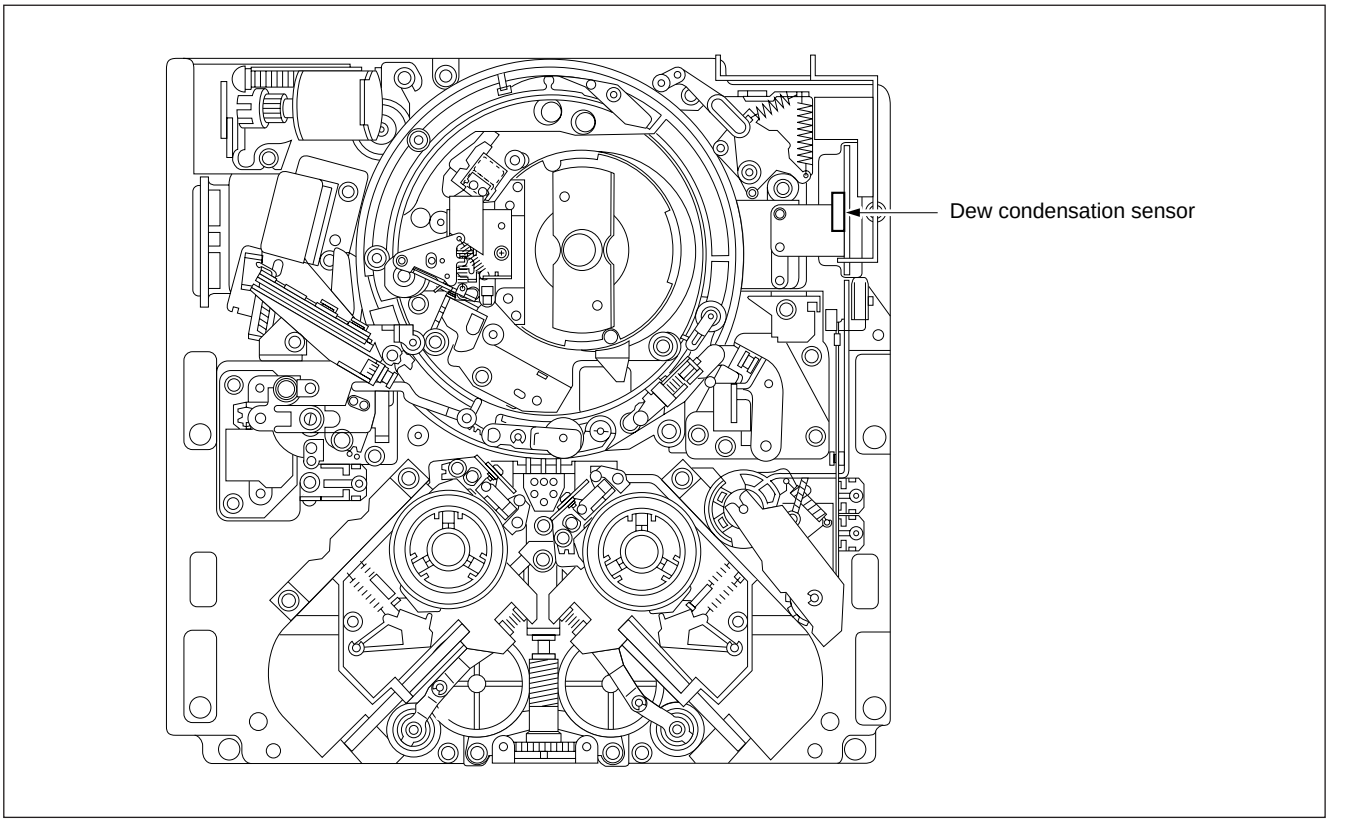
(1) Slightly touch the sensor using a cotton swab moistened by water.
- Check the superimposed display to see that a character string changes from "DRY" to "WET!".

(2) Wipe the sensor using a dry cotton swab to eliminate the moisture or evaporating the moisture completely using a blower.
- Check to see that "WET!" returns to "DRY".

(3) To finish the check, press the MENU button once.

In case of NG

- Check each sensor itself.
- Check the detection circuit on the MS-58 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Location of Dew Condensation Sensor

C010 : S REEL MOTOR
C011 : T REEL MOTOR

```
SERVO CHECK
 MOTOR CHECK
C010:S REEL MOTOR


 TURN JOG DIAL
      IN JOG MODE
```

These submenus check the function of an S reel motor or T reel motor.

Checking

(1) Turn the search dial (in JOG mode).
- Check to see that the reel table rotates in the specified direction at a fixed speed (about one revolution per second) after releasing the reel brake.

```
SERVO CHECK
 MOTOR CHECK
C011:T REEL MOTOR


 TURN JOG DIAL
      IN JOG MODE
```

Rotating direction of search dial	Rotating direction of reel table
FORWARD (↺)	Clockwise (↺)
REVERSE (↻)	Counterclockwise (↻)

(2) Holt the rotation of the search dial.
- Check to see that the reel table stops and that the reel brake operates.

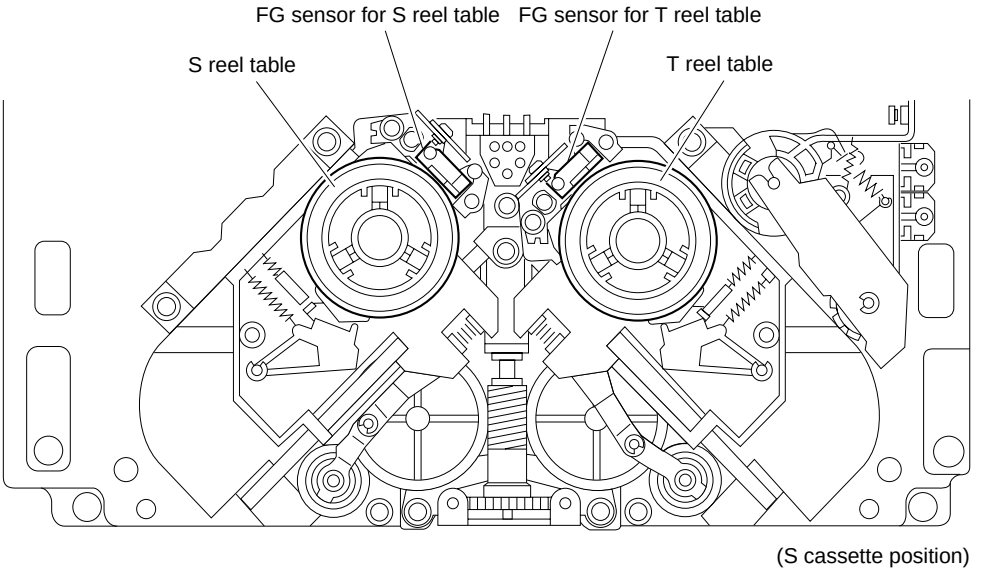
(3) To finish the check, press the MENU button once.

In case of NG

When the reel table operation is defective:
- Check the reel motor driver circuit on the DR-315 board.
- Check the reel motor.

When the reel table rotation is not constant at the fixed speed:
- Adjust the duty ratio of an S reel FG or T reel FG using a submenu A001 or A002.
- Check the FG output from a reel table FG sensor (DME on the SE-344 board).
- Check the reel FG shaping circuit on the MS-58 board.

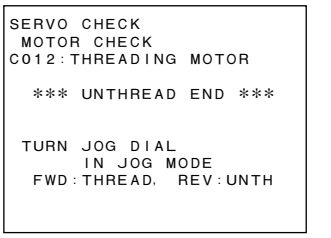
When the reel brake operation is defective:
- Check an S or T brake solenoid using a submenu C021 or C022.



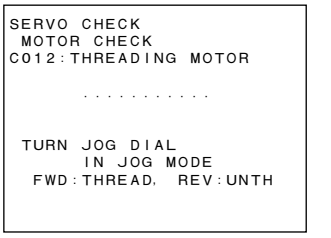
Locations of Reel Table FG Sensors

C012 : THREADING MOTOR

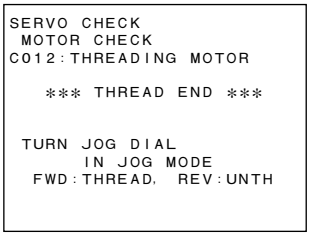
This submenu checks the functions of a threading motor, threading end sensor, and unthreading end sensor.



DIAL (↻) ↓ DIAL (↺) ↑



DIAL (↻) ↓ DIAL (↺) ↑



Checking

(1) Turn the search dial (in JOG mode) slowly continuously in FORWARD (↻) direction.
- Check to see that a threading ring rotates counterclockwise (↺) and that a message on the superimposed display changes from "UNTHREAD END" to ".....".
- Check to see that the threading ring stops in the threading end state and that the message changes from "....." to "THREAD END".

Note

When the search dial pauses halfway, the threading ring also stops.

(2) Turn the search dial (in JOG mode) slowly continuously in REVERSE (↺) direction.
- Check to see that the threading ring rotates clockwise (↻) and that the message changes from "THREAD END" to ".....".
- Check to see that the threading ring stops in the unthreading end state and that the message changes from "....." to "UNTHREAD END".

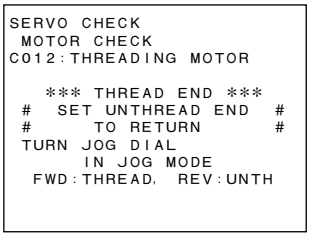
Note

When the search dial pauses halfway, the threading ring also stops.

(3) To finish the check, press the MENU button once in the unthreading end state.

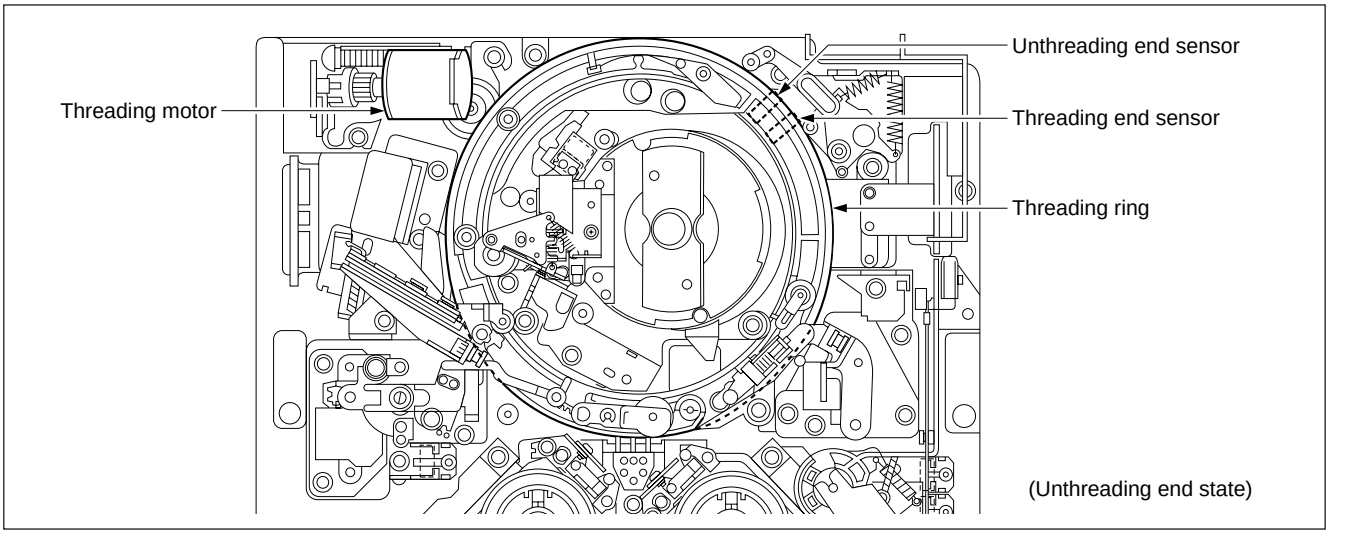
Note

Unless the unthreading end state, a massage "SET UNTHREAD END TO RETURN" will be displayed on pressing the MENU button.



In case of NG

- Check the mechanical abnormality.
- Check the threading motor driver circuit on the DR-315 board.
- Check the threading motor.
- Check the threading end sensor or unthreading end sensor on the TR-79 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Location of Threading End and Unthreading End Sensors

C013 : CASSETTE COMP. MOTOR

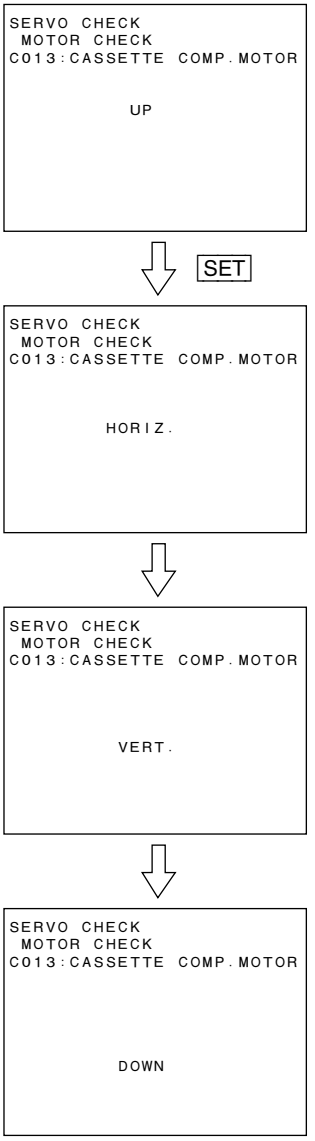
This menu checks the functions of a cassette compartment motor and cassette-down sensor.

CAUTION

Be careful not to execute this menu with the foreign matter put into the cassette compartment.
When a cassette tape is located in the cassette insertion slot, remove the cassette tape. If this menu executes without removing, the cassette tape will be caught halfway.

Notes

- If the cassette compartment has stopped halfway due to abnormality, “HORIZ.” or “VERT.” will be displayed on the superimposed display on selecting this menu.
- The power supply to the motor stops to protect the motor and movable parts when the driving time of the motor continuously exceeds about six seconds.



Checking

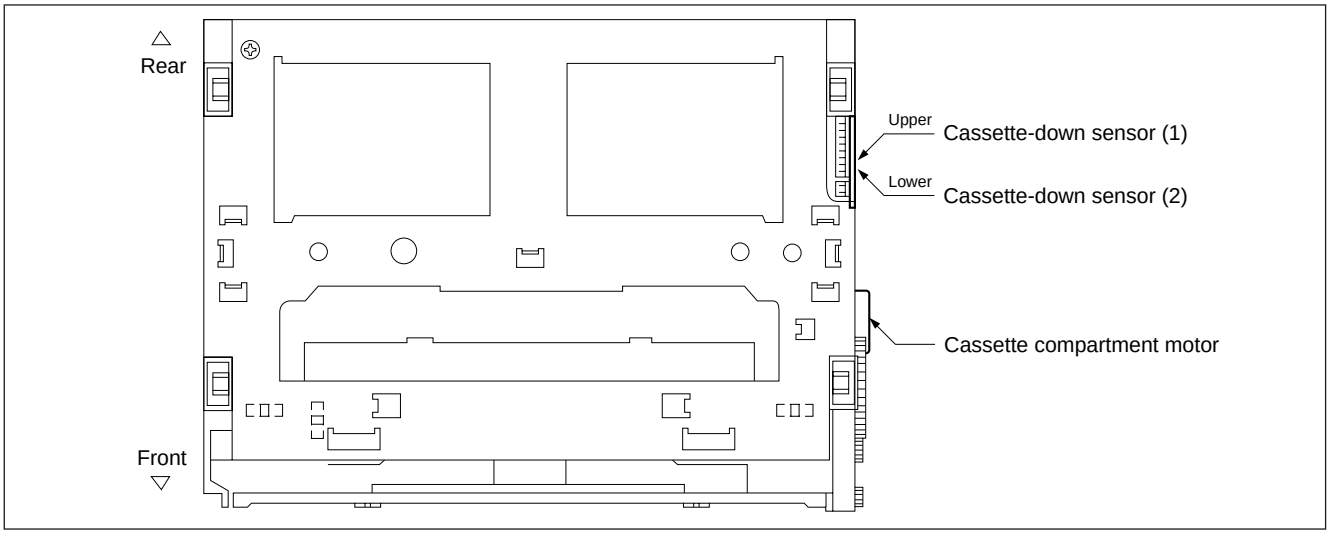
(1) When displaying “UP” on the superimposed display, press the SET button once.
- Check to see that the compartment goes down.
- Check to see that “UP” changes as follows:
  UP ⇨ HORIZ. ⇨ VERT. ⇨ DOWN

(2) When displaying “DOWN” , press the SET button once.
- Check to see that the compartment goes up.
- Check to see that “DOWN” changes as follows:
  DOWN ⇨ VERT. ⇨ HORIZ. ⇨ UP

(3) To finish the check, press the MENU button once.

In case of NG

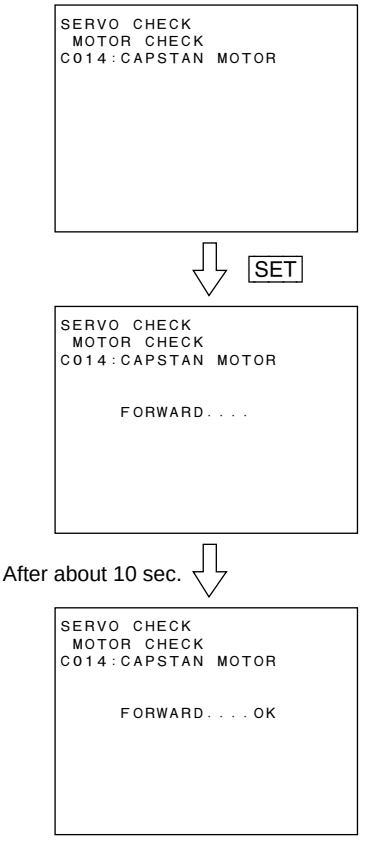
- Check the mechanical abnormality.
- Check the cassette compartment motor driver circuit on the DR-315 board.
- Check the cassette compartment motor.
- Check the cassette-down sensor (s) on the CL-29 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Top View of Cassette Compartment

C014 : CAPSTAN MOTOR

This submenu checks the function of a capstan motor.



Checking

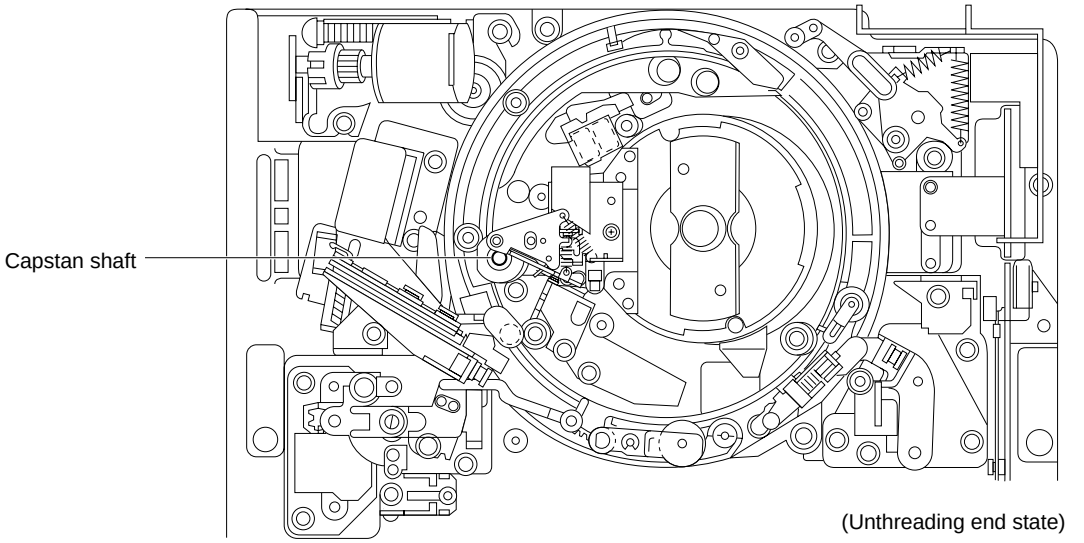
(1) Press the SET button.
- Check to see that a capstan shaft rotates in the forward (↺) direction.
- Check to see that the capstan shaft stops after displaying a message "FORWARD....OK" on the superimposed display.

(2) Press the SET button again.
- Check to see that the capstan shaft rotates in the reverse (↻) direction.
- Check to see that the capstan shaft stops after displaying a message "REVERSE....OK" on the superimposed display.

(3) To finish the check, press the MENU button once.

In case of NG

- Check the mechanical abnormality.
- Check the capstan motor driver circuit on the DR-315 board.
- Check the FG output from the capstan motor.
- Check the capstan FG shaping circuit on the MS-58 board.
- Check each circuit that processes the capstan FG on the SS-83 board.
- Check the capstan motor.



Location of Capstan Shaft

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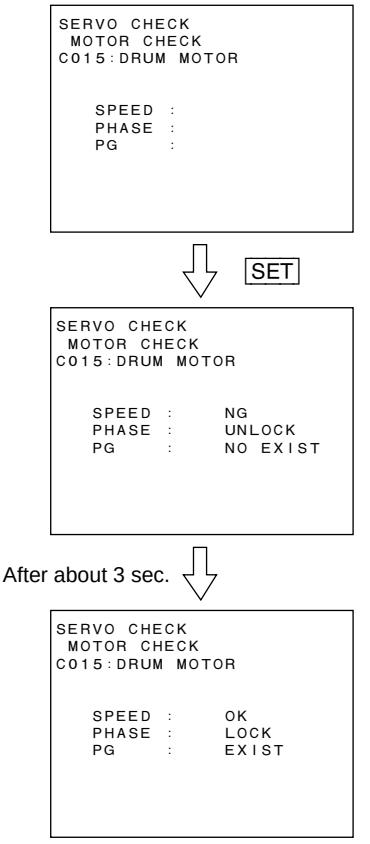
C015 : DRUM MOTOR

This submenu checks the function of a drum motor.



Checking

(1) Press the SET button.
- Check to see that the drum rotates.
- Check to see that the superimposed display changes as shown on the right.

(2) To finish the check, press the MENU button once.
- Check to see that the drum stops.

In case of NG

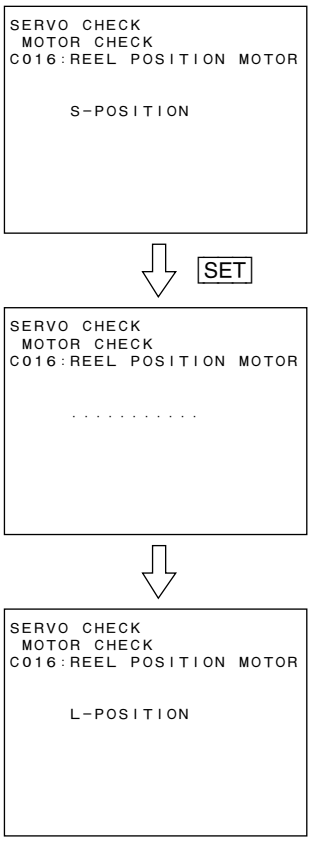
- Check the mechanical abnormality.
- Check the drum motor driver circuit on the DR-315 board.
- Check the FG and PG outputs from the drum motor.
- Check the drum FG/PG shaping circuit on the DR-315 board.
- Check each circuit that processes the drum FG/PG on the SS-83 board.

C016 : REEL POSITION MOTOR

This submenu checks the functions of a reel shift motor and two reel position sensors.

Note

The power supply to the motor stops to protect the motor and movable parts when the driving time of the motor continuously exceeds about six seconds.



Checking

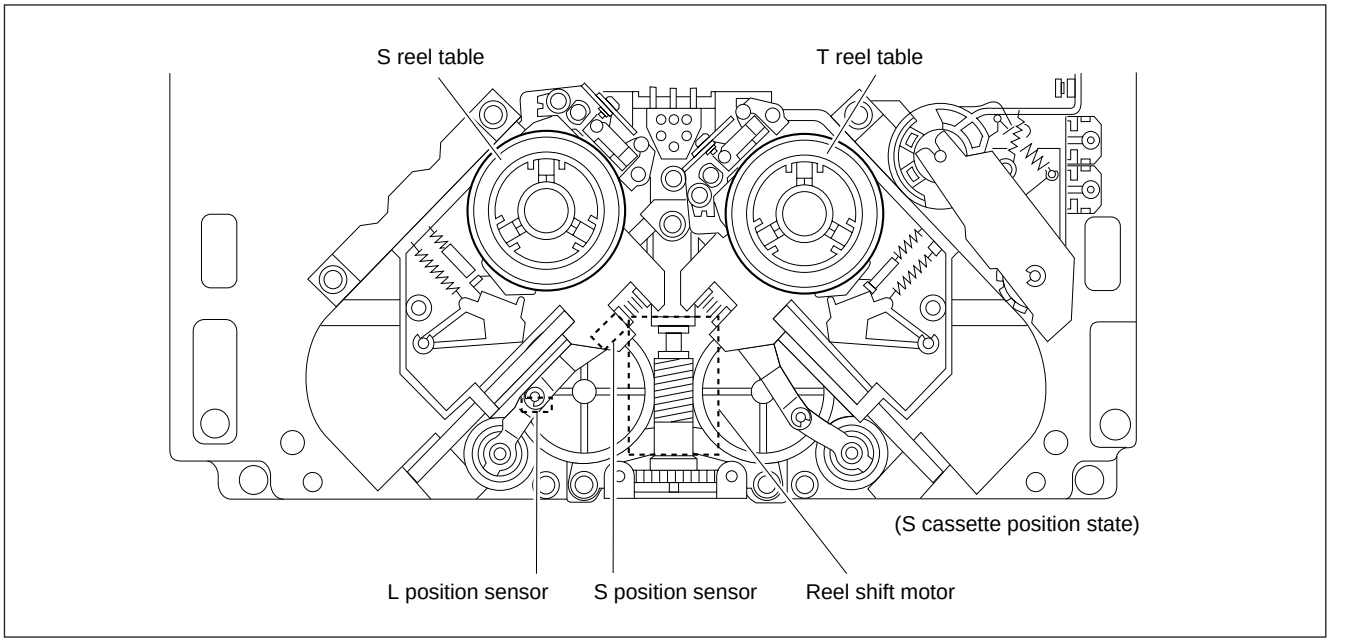
(1) When displaying "S-POSITION" on the superimposed display, press the SET button once.
- Check to see that an S and T reel tables move from the S position (S cassette position) to the L position (L cassette position).
- Check to see that "S-POSITION" changes as follows:
  S-POSITION ⇨ ..... ⇨ L-POSITION

(2) When displaying "L-POSITION", press the SET button once.
- Check to see that the S and T reel tables move from the L position (L cassette position) to the S position (S cassette position).
- Check to see that "L-POSITION" changes as follows:
  L-POSITION ⇨ ..... ⇨ S-POSITION

(3) To finish the check, press the MENU button once.

In case of NG

- Check the mechanical abnormality.
- Check the reel shift motor driver circuit on the DR-315 board.
- Check the reel shift motor.
- Check the S or T position sensor on the PTC-71 board.
- Check the sensor input port of MPU (IC1 on the MS-58 board).



Locations of S and L Position Sensors and Reel Shift Motor

C020 : PINCH ROLLER

This submenu checks the function of a pinch roller solenoid.

```
SERVO CHECK
 PLUNGER SOLENOID
C020:PINCH ROLLER
```

Checking

(1) Press the SET button once.
- Check a click sound when the pinch roller solenoid is activated.

Note

A pinch lever comes near the capstan.

(2) Press the MENU button once to exit the submenu.

Note

The solenoid is deactivated because its driving voltage is cut off.

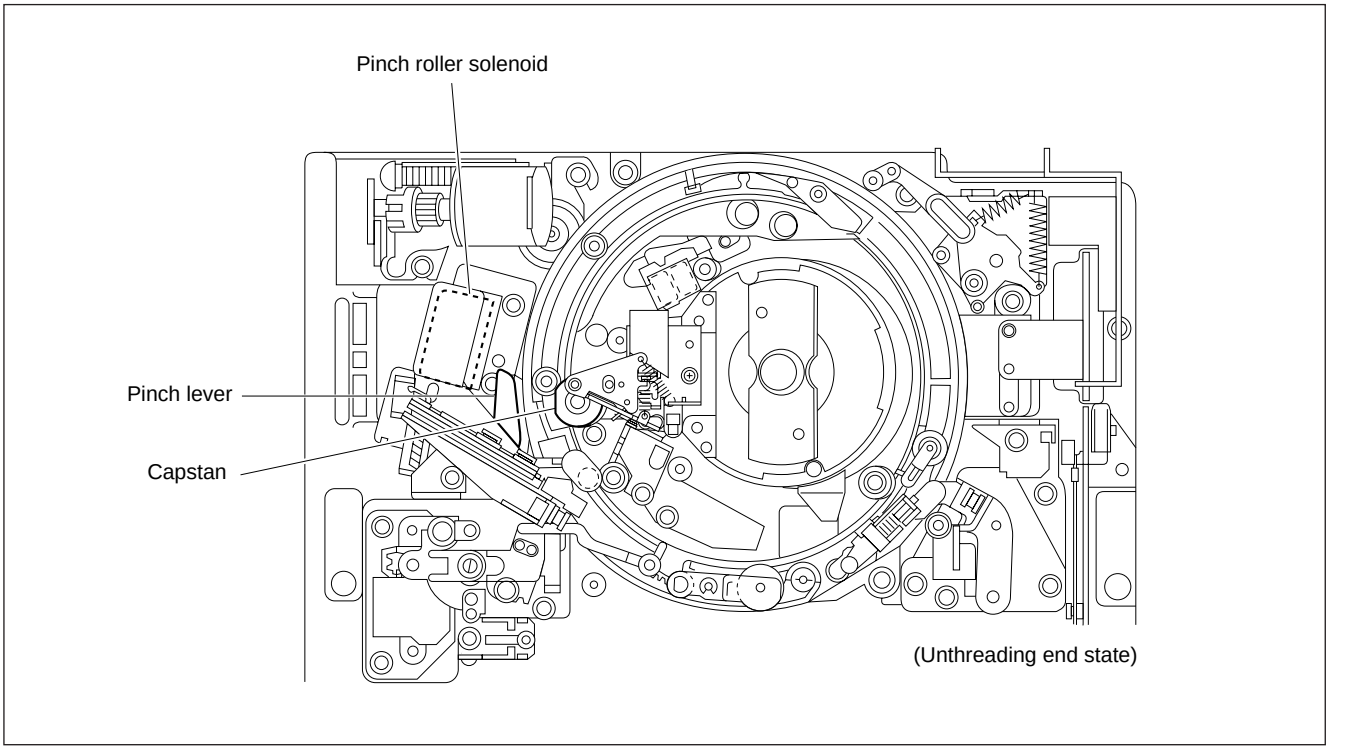
(3) To finish the check, slightly push the pinch lever toward the pinch roller solenoid to return a iron core of the pinch roller solenoid to the former position with a finger.

Note

When rechecking without returning the iron core to the former position, the click sound is not generated even if the pinch roller solenoid is activated.

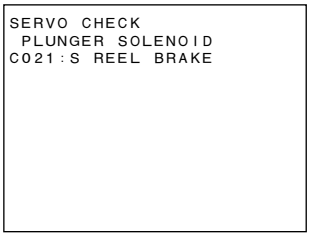
In case of NG

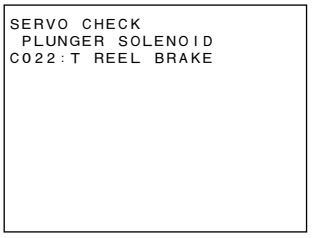
- Check the mechanical abnormality.
- Check the pinch roller solenoid driver circuit on the DR-315 board.
- Check the pinch roller solenoid itself.



Locations of Pinch Roller Solenoid and Pinch Lever

C021 : S REEL BRAKE
C022 : T REEL BRAKE





These submenus check the function of an S or T reel brake solenoid.

Checking

(1) Press the SET button.
- Check a click sound when the reel brake solenoid is activated.

Note

The reel table can be smoothly turned with a hand because the brake is released.

(2) Press the MENU button once to exit the submenu.

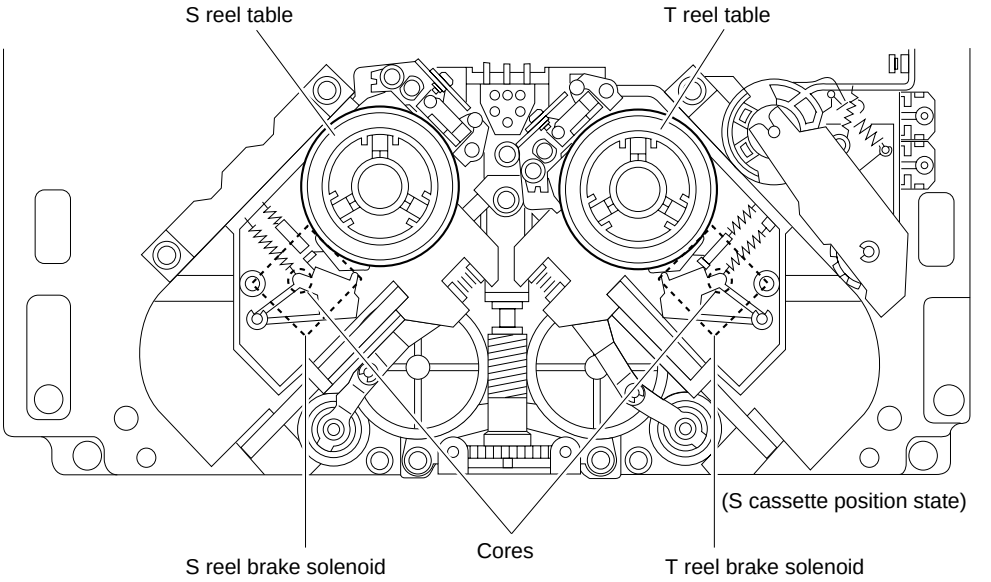
Note

The solenoid is deactivated because its driving voltage is cut off.

(3) Turn the reel table by fingers.
- Check that the brake is applied to the reel table.

In case of NG

- Check the mechanical abnormality.
- Check the reel brake solenoid driver circuit on the DR-315 board.
- Check the reel brake solenoid itself.



Locations of Reel Brake Solenoids

C023 : CLEANING ROLLER

This submenu checks the function of a cleaning roller solenoid.

```
SERVO CHECK
 PLUNGER SOLENOID
C023:CLEANING ROLLER
```

Checking

(1) Press the SET button.
- Check to see that a cleaning roller momentarily touches the drum before releasing it from the drum.

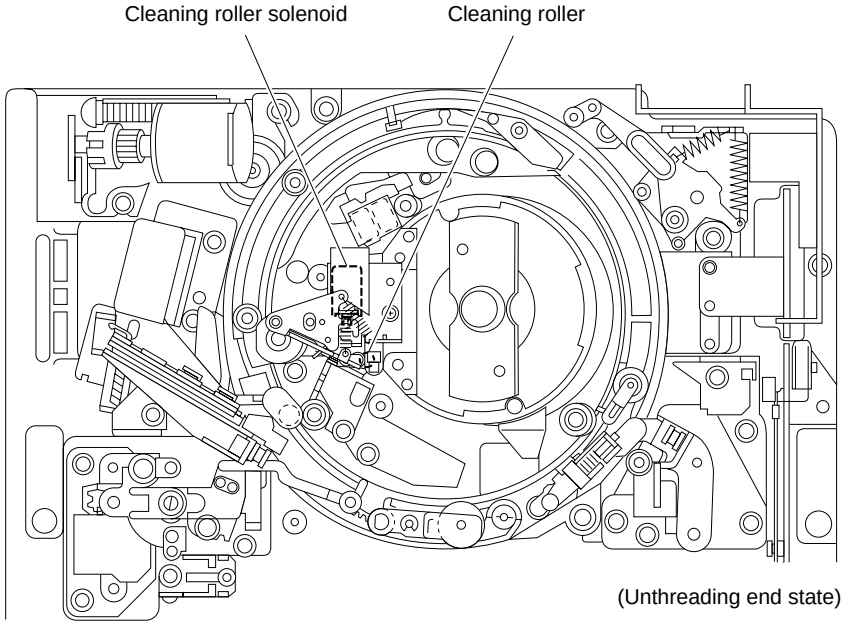
CAUTION

The cleaning roller solenoid causes burning when it remains activating.
If the cleaning roller is not away from the drum, turn off the power immediately.

(2) To finish the check, press the MENU button once.

In case of NG

- Check the mechanical abnormality.
- Check the cleaning roller solenoid driver circuit on the DR-315 board.
- Check the cleaning roller solenoid itself.

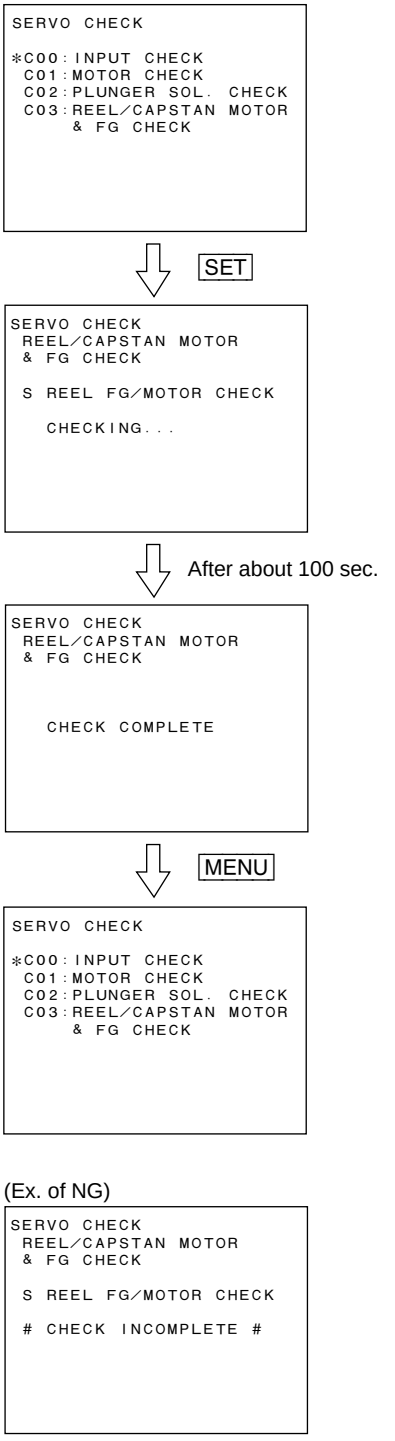


Locations of Cleaning Roller and Cleaning Roller Solenoid

C03 : REEL/CAPSTAN MOTOR & FG CHECK

This menu checks the following items automatically and continuously.

- S reel FG duty ratio (C031 : S REEL FG/MOTOR CHECK)
- T reel FG duty ratio (C032 : T REEL FG/MOTOR CHECK)
- Capstan FG duty ratio (C033 : CAPSTAN FG/MOTOR CHECK)
- S reel offset/friction level (C034 : S REEL OFFSET/FRICTION)
- T reel offset/friction level (C035 : T REEL OFFSET/FRICTION)
- S reel motor torque (C036 : S REEL MOTOR TORQUE)
- T reel motor torque (C037 : T REEL MOTOR TORQUE)



To execute the check

(1) Select C03 in the servo check mode and press the SET button to start the check.
- During the automatic check, the item name in execution and a message "CHECKING..." will be displayed on the superimposed display. Only the menu number (C031 to C037) will be displayed in the time data display area.

(2) Check to see that all checks are completed and that a message "CHECK COMPLETE" is displayed.
- If a message "# CHECK INCOMPLETE #" is displayed halfway, refer to the following NG cases during the check.

(3) To return to the selection of the servo check mode, press the MENU button.

In case of NG during (C031) S REEL FG/MOTOR CHECK

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel FG duty adjustment (A001).

In case of NG during (C032) T REEL FG/MOTOR CHECK

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel FG duty adjustment (A002).

In case of NG during (C033) CAPSTAN FG/MOTOR CHECK

Perform the capstan motor check (C014). If no abnormality is found in the motor or its drive circuit, perform the capstan FG duty adjustment (A003).

In case of NG during (C034) S REEL OFFSET/FRICTION

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel offset/friction adjustment (A004).

In case of NG during (C035) T REEL OFFSET/FRICTION

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel offset/friction adjustment (A005).

In case of NG during (C036) S REEL MOTOR TORQUE

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel torque adjustment (A006).

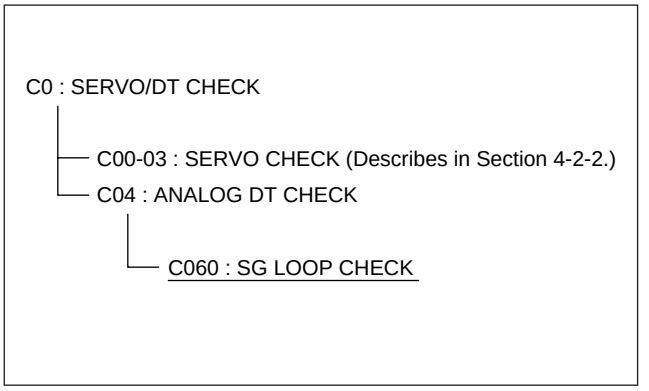
In case of NG during (C037) T REEL MOTOR TORQUE

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel torque adjustment (A007).

(Ex. of NG)

4-2-3. ANALOG DT CHECK Mode (C04)

The C04 : ANALOG DT CHECK mode is used to check the analog DT system. The underlined menu in the menu tree below is described next.



Menu Tree of Analog DT System Check Mode

C060 : SG LOOP CHECK

This menu checks the feedback loop of the strain gauge for analog Betacam playback.

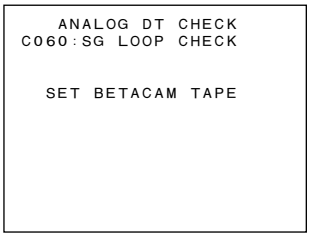
To execute the check

(1) Prepare a cassette tape for Betacam or Betacam SP.
Note
The recording content does not matter because this cassette tape is used to enter an analog Betacam playback mode.
(2) Insert the cassette tape into this unit.
(3) Press the SET button to initiate the automatic check.
- During the automatic check, a message “CHECK-ING.....” will be displayed on the superimposed display.

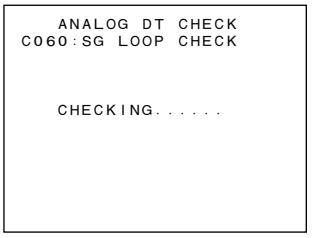
(4) Check the result of checking.
- On completing the automatic check, a message “CHECK COMPLETE” will be displayed.
- If the automatic check fails, a message “# CHECK INCOMPLETE #” is displayed. In this case, refer to “When failing the automatic check” on the right.

(5) To exit the menu, press the MENU button once.
- The cassette tape will automatically be ejected in exiting the menu.

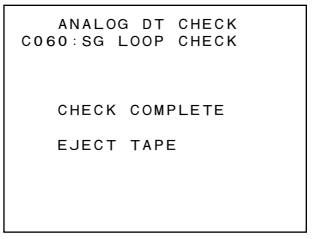
Example of display and operation



(1)(2) ⇩ Insert the cassette tape
(3) ⇩ SET



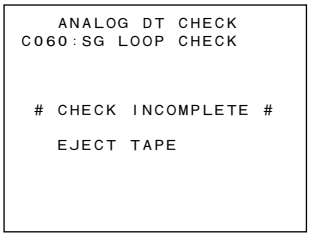
⇩



(4) ⇩ Check
(5) ⇩ MENU

When failing the automatic check

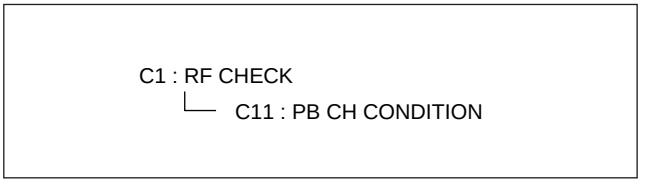
If the message “# CHECK INCOMPLETE #” is displayed during the automatic check, perform the following check.
(1) Check the bimorph driving circuit on the DT-34D board.
(2) Check the bimorph driving circuit on the SS-83 board.
(3) Check the signal transmission system (slip ring etc.).



Ex.: When failing the automatic check

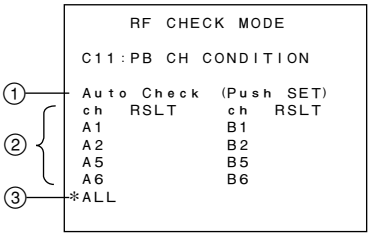
4-2-4. RF CHECK Mode (C1)

The C1 : RF CHECK mode is used to check the PB RF system based on an Betacam SX format.
One menu is available.



Menu Tree of RF System Check Mode

C11 : PB CH CONDITION



This menu displays the error condition for each channel in three steps (GRN, YEL, and RED) when a tape recorded in Betacam SX format is played back by tracking.
C11 checks using each PB signal from the PB heads (A1, A2, A5, A6, B1, B2, B5, and B6 channels).

Notes

- During normal operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be checked using a CH CONDITION indicator.
- If abnormality exists in the servo system, this menu does not function properly.

Description of superimposed display

① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) :	Press the SET button to initiate the check.
Insert SR5-1 :	Insert an alignment tape.
Auto Tracking... :	Tracking is in an optimization process.
Auto Checking... :	Check is in progress.
Auto Check Complete :	Check is completed.
Auto Check Failure :	Check failure
Condition NG :	Error condition defect

② To check the condition for single channel, select a channel name using an ∗ mark.
After the check of the channel is completed, the condition (GRN, YEL, or RED) will be displayed on the right of the channel name.
Even if the check fails, “RED” will be displayed.

Note

“RSLT” indicates the result.

③ To check the conditions for all channels at a time, select “ALL” using the ∗ mark.
During the check, the condition in each channel is displayed in area ②.
After the check for all channels is completed, “GRN” is also displayed on the right of “ALL” when the conditions for all channels are GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of “ALL”.

To execute the check

(1) Insert the alignment tape SR5-1(for 525/60 system) or SR5-1P (for 625/50 system).

Note

To complete the check, the inserted cassette tape requires the continuous playback-able recorded portion more than a check execution time.
The check execution time is usually about ten seconds in each channel check and about 80 seconds in an ALL check.

(2) Turn the search dial to set the ∗ mark to a channel to be checked or “ALL”.
- Usually, select “ALL”.

(3) Press the SET button to initiate the automatic check.
- The check is initiated after automatically running the tape in the PLAY mode.
- During the check, the message “Auto Tracking ...” or “Auto Checking ...” will be displayed.
  During ALL check execution, the check result in the channel will be displayed every time a one-channel check is completed.
  The time data display area displays an ordinary time counter.
- To cancel the check, press the MENU button once.

Notes

- When no cassette tape is inserted, the message “Insert SR5-1” will be displayed.
  In this case, insert the alignment tape. The check is then initiated after automatically running the tape in the PLAY mode.
- If the message “Auto Check (Push SET)” is continuously displayed, the non-recorded portion on the tape is judged to be check. Set the tape position to the beginning of recorded portion.
- Keep the unit until automatic check is completed. Check cannot be properly performed in other mode than PLAY mode.
  If the unit enters into other mode than PLAY mode, the check freezes or the condition becomes “RED”.

(4) Check to see the result of checking.
- When no abnormality is found, “GRN” will be displayed on the right of the selected channel or “ALL”.
- If the message “Auto Check Failure” is displayed, refer to the “For Check Failure (C11)” on next page.
- If the message “Condition NG” is displayed or if the conditions other than “GRN” are displayed on the right of the checked channel, refer to the “For Condition NG (C11)” on page 4-31.

Notes

- If the check results for all channels are “RED” when displaying the message “Condition NG” in ALL check, refer to the “For Check Failure (C11)”.
- “GRN”, “YEL”, or “RED” is also displayed in the time data display area. In only the time data display area, it cannot be discerned whether the condition is NG or check failure when displaying “RED”.
  The check result for each channel is displayed in the time data display area on turning the search dial after completing ALL check.

(5) To exit the menu, press the MENU button once.
To execute the check again in this menu, go to step (2).

Note

To change the cassette tape before starting the check, press the SET button while pressing the EJECT button.
The tape is then ejected without influencing the check result. Insert another cassette tape and press the PLAY button. The check is then initiated. This operation does not coincide with the message on the superimposed display.

Example of display and operation

When ALL is selected in C11 : PB CH CONDITION.

Superimposed display

```
     RF CHECK MODE

 C11:PB CH CONDITION

 Auto Check (Push SET)
 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

Time data display area

```
C11 -ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ [SET]

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Tracking ...
 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Checking ...
 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Check Complete
 ch  RSLT    ch  RSLT
 A1  GRN     B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

⇩

```
     RF CHECK MODE □

 C11:PB CH CONDITION

 Auto Tracking ...
 ch  RSLT    ch  RSLT
 A1  GRN     B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

⇩
(omitted)
⇩
(continue)

(continued)
⇩

```
     RF CHECK MODE

 C11:PB CH CONDITION

 Auto Check Complete
 ch  RSLT    ch  RSLT
 A1  GRN     B1  GRN
 A2  GRN     B2  GRN
 A5  GRN     B5  GRN
 A6  GRN     B6  GRN
*ALL GRN
```

```
C11 -ALL GRN
```

(4) ⇩ Check
(5) ⇩ [MENU]

For Check Failure (C11)

Recheck after changing the portion on the tape.
If no check failure occurs again, a trouble is considered to exist on the tape portion used in the previously check.

Cassette tape check

Check failure occurs if using the tape recorded in otherwise than Betacam SX format or the non-recorded tape. Moreover, check failure will also occur on the tape recorded in the failed Betacam SX VTR. Confirm that the tape can be correctly played back in the other normal operating Betacam SX VTR.

If no trouble is found on the used tape

The possible cause below are considered.

- Heads clogging
  ⇨ Perform steps (1) to (9) of “For Condition NG (C11)” on next page.
- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A0 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/ connection defect
  ⇨ Replace or reinstall the brush/slip ring assembly. (Refer to the maintenance manual part 2, volume-1.)
- Harness (between EQ-75C board and drum assembly) connection defect
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- EQ-75C board defect
- Drum assembly defect

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For Condition NG (C11)

Recheck according to the procedures below.

(1) If a check is performed without using alignment tape SR5-1/SR5-1P, recheck in the menu C11 using the alignment tape SR5-1/SR5-1P.
When no abnormality is found, the recheck is completed.

Note

When no abnormality is found during the check using the alignment tape, a trouble (tape is damaged or recording is not done properly) is considered to exist on the tape portion used in the previously check.

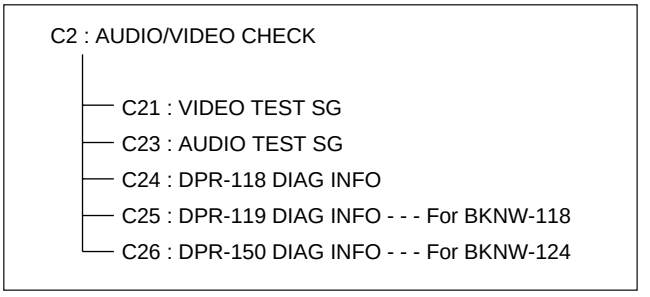
(2) Change the playback portion on the alignment tape.
(3) Recheck in the menu C11.
When no abnormality is found, the recheck is completed.
(4) Clean the drum using a cleaning tape according to Section 5-2-1.
(5) Recheck in the menu C11 using the alignment tape.
When no abnormality is found, the recheck is completed.
(6) Clean the drum using the cleaning tape again (the amount of the tape used is 15 seconds)
(7) Recheck in the menu C11 using the alignment tape.
When no abnormality is found, the recheck is completed.
(8) Clean the drum (video heads) with a cleaning cloth according to Sections 5-2-2 and 5-2-3
(9) Recheck in the menu C11 using the alignment tape.
When no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After checking the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to the maintenance manual part 2, volume-1.)
- In the tape transport system, adjustment defect or component part installation defect
  ⇨ Readjust the tape transport system or reinstall the part.
  (Refer to the maintenance manual part 2, volume-1.)
- EQ-75C board defect
- Drum assembly defect

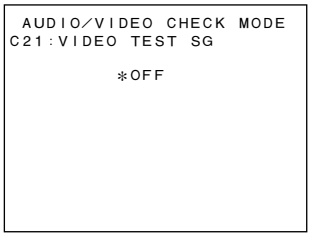
4-2-5. AUDIO/VIDEO CHECK Mode (C2)

The C2 : AUDIO/VIDEO CHECK mode has five menus (including the menu displayed when the option is installed) that are useful for checking audio and video systems.


C2 : AUDIO/VIDEO CHECK
C21 : VIDEO TEST SG
C23 : AUDIO TEST SG
C24 : DPR-118 DIAG INFO
C25 : DPR-119 DIAG INFO - - - For BKNW-118
C26 : DPR-150 DIAG INFO - - - For BKNW-124

Menu Tree of Audio/Video Systems Check Mode

C21 : VIDEO TEST SG



This menu selects the operation in the maintenance mode of a video test signal generator incorporated into this unit.

OFF: The video test signal generator operation stops.

Except OFF: A video test signal generator outputs the selected signals (below).

100% color bars	75% color bars
75% reverse color bars	
Bowtie	Pulse and bar
Multi-burst	H sweep
5-step	Ramp
Shallow ramp	Red signal
50% flat	100% flat
Black burst	
Pathological check code	
NTC7 (NTSC) ⇦ Only for 525/60 system	
Line330 (625) ⇦ Only for 625/50 system	

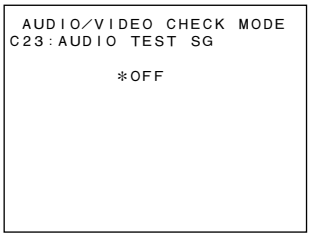
Setting of video test signal generator

To set the video test signal generator, turn the search dial while pressing the JOG button and display the desired setting.
This setting is valid until the maintenance mode is terminated.

Note

This menu is set to OFF when the maintenance mode is activated.

C23 : AUDIO TEST SG



This menu selects the operation in the maintenance mode of an audio test signal generator incorporated in this unit.

OFF: The audio test signal generator operation stops.

Except OFF: An audio test signal generator outputs the selected signals (below).

Silence
1 kHz sine 0 VU
1 kHz sine burst/1 field
1 kHz sine burst/2 field
1 kHz sine burst/5 field
1 kHz sine burst/8 field
1 kHz sine burst(10)
4 kHz sine burst(40)
Saw wave

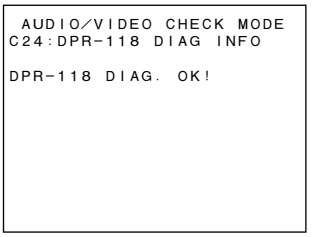
Setting of audio test signal generator

To set the audio test signal generator, turn the search dial while pressing the JOG button and display the desired setting.
This setting is valid until the maintenance mode is terminated.

Note

This menu is set to OFF when the maintenance mode is activated.

C24 : DPR-118 DIAG INFO



This function informs the result of the self-diagnosis of the DPR-118 board in this unit.
When a failure occurs on the DPR-118 board, this function guess the default IC but do not specified.

Note

"ERROR" may be displayed as the diagnosis result even if the boards except DPR-118 are defective.

An initialize check and something check are available as the self-diagnosis function.

- In the initialize check, check the communication of the communication bus (PAD0-7, STAT0-1, STRB, and CS) between SY2 CPU on the SS-83 board and each IC on the DPR-118 board.
  Initialization data is transferred from SY2 CPU to each IC. After that, the initialization data set in each IC is read and compared with the initialization data transferred at first.
- In the something check, a parity check and external memory check are performed for the input signals of the following ICs, and the result of the self-diagnosis of each IC is displayed by reading from SY2 CPU.

Target IC for the diagnosis

No.	Screen display	Target IC Ref. No. (IC name)
1, 11	F-CONT	IC251 (CXD8997R)
2, 12	DIGI FIL	IC209 (CXD9025R)
3, 13	SX ENC	IC200 (CXD8973BR)
4, 14	SX MEP	IC300 (CXD8974AR)
6, 16	OUTER	IC600 (CXD8945BR)
7, 17	SX DEC	IC800 (CXD9012AR)

To display the self-diagnosis function result

(1) Select the C24 : DPR-118 DIAG INFO menu.
(2) To scroll the screen, turn the JOG dial.
  Downward: Turn it in REVERSE (↺) direction.
  Upward: Turn it in FORWARD (↻) direction.
(3) Press the MENU button to terminate the menu after checking the self-diagnosis result.

Screen display samples

In case of normal

```
 AUDIO/VIDEO CHECK MODE
C24:DPR-118 DIAG INFO

DPR-118 DIAG. OK!

 INITIALIZE CHECK..
  1.F-CONT    INIT.     OK
  2.DIGI FIL  INIT.     OK
  3.SX ENC    INIT.     OK
  4.SX MEP    INIT.     OK
  6.OUTER     INIT.     OK
  7.SX DEC    INIT.     OK

 SOMETHING CHECK..
 11.F-CONT    CHECK.    OK
 12.DIGI FIL  CHECK.    OK
 13.SX ENC    CHECK.    OK
 14.SX MEP    CHECK.    OK
 16.OUTER     CHECK.    OK
 17.SX DEC    CHECK.    OK
```

In case of abnormal

```
 AUDIO/VIDEO CHECK MODE
C24:DPR-118 DIAG INFO

DPR-118 DIAG. ERROR!

 INITIALIZE CHECK..
  1.F-CONT    INIT.     OK
  2.DIGI FIL  INIT.     OK
  3.SX ENC    INIT.     NG
  4.SX MEP    INIT.     OK
  6.OUTER     INIT.     OK
  7.SX DEC    INIT.     OK

 SOMETHING CHECK..
 11.F-CONT    CHECK.    NG
     PARITY ERR B-IN
     PARITY ERR A-IN
 12.DIGI FIL  CHECK.    OK
 13.SX ENC    CHECK.    NG
     PARITY ERR MEP
 14.SX MEP    CHECK.    OK
 16.OUTER     CHECK.    OK
 17.SX DEC    CHECK.    OK
```

Displays NG for failure item.

In case of NG, the detail data is displayed.

Detail description of abnormal case

INITIALIZE CHECK:

The possible cause below is judged as an NG item.

- The target IC is defective.
- The foiled pattern on the board connecting target IC and SY2 CPU is defective.
- The component part between target IC and SY2 CPU is defective.

INITIALIZE CHECK Screen display	Target IC	Target IC's pin number connected to SY2 CPU
1. F-CONT INIT. NG	IC251	Pins 109 to 116, 118 to 121
2. DIGI FIL INIT. NG	IC209	Pins 113 to 116, 118 to 125
3. SX ENC INIT. NG	IC200	Pins 128, 133 to 135, 141 to 144, 146 to 149
4. SX MEP INIT. NG	IC300	Pins 128, 133, 134, 141 to 144, 146 to 149
6. OUTER INIT. NG	IC600	Pins 9 to 16, 20 to 23
7. SX DEC INIT. NG	IC800	Pins 44 to 7, 53 to 59, 62

SOMETHING CHECK:

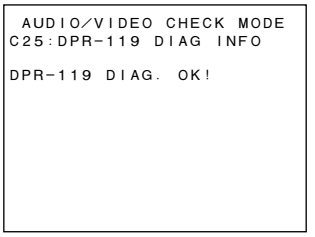
The possible cause below is judged as an ERR item.

- The target IC is defective.
- The foiled pattern on the board connecting target IC and its connected IC is defective.
- The component part between target IC and its connected IC is defective.
- Connected IC is defective.

SOMETHING CHECK Screen display	Target IC (Its pin number) [Ref. No. of Connected IC]
11. F-CONT CHECK. NG	
PARITY ERR B-IN	IC251 (Pins 94 to 101, 103 to 106)
PARITY ERR A-IN	IC251 (Pins 74 to 80, 82 to 88), [IC800]
12. DIGI FIL CHECK. NG	
PARITY ERR A-IN	IC209 (Pins 3 to 8, 10 to 17), [IC251]
13. SX ENC CHECK. NG	
PARITY ERR MEP	IC200 (Pins 165, 168 to 173, 175 to 179, 182 to 186, 189 to 192, 195 to 199), [IC300]
PARITY ERR VIDEO	IC200 (Pins 88, 89, 92 to 101, 105, 106), [IC209]
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC200 (Pins 110 to 113, 116, 121 to 127)
SDRAM ERR ALL	IC200, [IC205 to IC208]
Note Displays "ALL" wherever an abnormal point occurs.	
14. SX MEP CHECK. NG	
SDRAM ERR ALL	IC300, [IC205 to IC208]
Note Displays "ALL" wherever an abnormal point occurs.	
INPUT ERR PARITY	IC300 (Pins 238 to 241, 244 to 247, 250, 251), [IC200]
INPUT ERR SYNC	IC300 (Pin 238), [IC200]
CLOCK ERR 81M CLOCK ERR 54M CLOCK ERR 27M CLOCK ERR 13.5M PLL ERR 81M PLL ERR 54M PLL ERR 27M	IC300 (Pins 107, 111 to 113, 116, 121 to 127)

SOMETHING CHECK Screen display	Target IC (Its pin number) [Ref. No. of Connected IC]
16. OUTER CHECK. NG	
PARITY ERR xx	IC600 (Pins 49, 50, 57 to 59, 62 to 66)
Note On “xx displays the number of the input parity errors.	
SDRAM ERR NT	IC600, [IC603]
SDRAM ERR JOG	IC600, [IC601, IC602]
17. SX DEC CHECK. NG	
SDRAM ERR ALL	IC800, [IC801, IC802]
Note Displays “ALL” wherever an abnormal point occurs.	
PARITY ERR MEP	IC800 (Internal connection of IC800)
PARITY ERR STREAM	IC800 (Pins 88 to 95, 98, 112)
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC800 (Pins 99, 120 to 124, 127 to 132)

C25 : DPR-119 DIAG INFO



This function informs the result of the self-diagnosis of the DPR-119 board of BKNW-118. It is displayed when the BKNW-118 option is installed.
When a failure occurs on the DPR-119 board, this function guess the default IC but do not specified.

Note

“ERROR” may be displayed as the diagnosis result even if the boards except DPR-119 are defective.

An initialize check and something check are available as the self-diagnosis function.

- In the initialize check, check the communication of the communication bus (PAD0-7, STAT0-1, STRB, and CS) between SY2 CPU on the SS-83 board and IC213 or IC216 on the DPR-119 board.
  Initialization data is transferred from SY2 CPU to each IC. After that, the initialization data set in each IC is read and compared with the initialization data transferred at first.
- In the something check, a parity check and FIFO memory check are performed for the input signals of IC200, and the result of the self-diagnosis of IC200 is displayed by reading from SY2 CPU on the SS-83 board.

Target IC for the diagnosis

No.	Screen display	Target IC Ref. No. (IC name)	Remarks
1	SDTI TX	IC213 (CXD8969AR)	Initialize check only
2	AU FEED	IC106 (CXD211-124Q)	Initialize check only
13	V-PACK	IC200 (CXD8977R)	Something check only

To display the self-diagnosis function result

(1) Select the C25 : DPR-119 DIAG INFO menu.
(2) To scroll the screen, turn the JOG dial.
  Downward: Turn it in REVERSE (↺) direction.
  Upward: Turn it in FORWARD (↻) direction.
(3) Press the MENU button to terminate the menu after checking the self-diagnosis result.

Screen display samples

In case of normal

```
 AUDIO/VIDEO CHECK MODE
C25:DPR-119 DIAG INFO

DPR-119 DIAG. OK!

 INITIALIZE CHECK..
  1.SDTI TX   INIT.     OK
  2.AU FEED   INIT.     OK

 SOMETHING CHECK..
 13.V-PACK    CHECK.    OK
```

In case of abnormal

```
 AUDIO/VIDEO CHECK MODE
C25:DPR-119 DIAG INFO

DPR-119 DIAG. ERROR!

 INITIALIZE CHECK..
  1.SDTI TX   INIT.     OK   } Displays NG for failure item.
  2.AU FEED   INIT.     OK   }

 SOMETHING CHECK..
 13.V-PACK    CHECK.    NG   }
     LAST  BYTE    ERR 1     } In case of NG,
     FRAME TOP     ERR 1     } the detail data is displayed.
     GOP   TOP     ERR 1     }
     FIFO  PARITY ERR 1      }
     INPUT PARITY ERR 1      }
```

Detail description of abnormal case

INITIALIZE CHECK:
The possible cause below is judged as an NG item.

- The target IC is defective.
- The foiled pattern on the board connecting target IC and SY2 CPU is defective.
- The component part between target IC and SY2 CPU is defective.

INITIALIZE CHECK Screen display	Target IC	Target IC's pin number connected to SY2 CPU
1. SDTI TX	IC213	Pins 5 to 14, 16, and 17
2. AU FEED	IC106	Pins 42 to 49 and 51 to 54

SOMETHING CHECK (13. V-PACK CHECK NG):
The possible cause below is judged as an ERR item.

- IC200 is defective.
- The foiled pattern on the board connecting IC200 and its connected IC is defective. (at parity error only)
- The component part between IC200 and its connected IC is defective. (at parity error only)
- Connected IC is defective. (at parity error only)

Parity error	Ref. No. of IC connected to IC200
FIFO PARITY ERR	IC204, IC205, IC208, and IC209
INPUT PARITY ERR	IC1100 and IC1101 on DPR-118 board

C26 : DPR-150 DIAG INFO

```
 AUDIO/VIDEO CHECK MODE
C26:DPR-150 DIAG INFO

DPR-150 DIAG. OK!
```

This function informs the result of the self-diagnosis of the DPR-150 board of BKNW-124. It is displayed when the BKNW-124 option is installed.
When a failure occurs on the DPR-150 board, this function guess the default IC but do not specified.

Note

"ERROR" may be displayed as the diagnosis result even if the boards except DPR-150 are defective.

An initial-verify and others check are available as the self-diagnosis function.

- In the initial-verify, check the communication of the communication bus (PAD0-7, STAT0-1, STRB, and CS) between SY3 CPU and each IC on the DPR-150 board. Initialization data is transferred from SY3 CPU to each IC. After that, the initialization data set in each IC is read and compared with the initialization data transferred at first.
- In the others check, a parity check and external memory check are performed for the input signals of the following ICs, and the result of the self-diagnosis of each IC is displayed by reading from SY3 CPU.

Target IC for the diagnosis

No.	Screen display	Target IC Ref. No. (IC name)	Remarks
1, 11	SX DEC 0	IC300 (CXD9012AR)	
2, 12	SX DEC 1	IC400 (CXD9012AR)	
3, 13	SX DEC 2	IC500 (CXD9012AR)	
4, 14	SX ENC 0	IC700 (CXD8973BR)	
5, 15	SX ENC 1	IC900 (CXD8973BR)	
6, 16	SX MEP	IC800 (CXD8974AR)	
7	SX MPEG0	IC702 (CXD9077BR)	Initial-verify only
8	SX MPEG1	IC906 (CXD9077BR)	Initial-verify only
9	SX MPEG2	IC606 (CXD9077BR)	Initial-verify only
a, 1a	DIGI FIL	IC603 (CXD9025R)	
b	SDTI CP	IC30* (CXD9139GF)	Initial-verify only
c	MSP MOE	IC1000 (XC4036XLA)	Initial-verify only

*: When the DPR-150 board's board number suffix is -11, this IC CXD9139GF is IC300 on the piggybacked DIF-109 board onto the DPR-150 board.

To display the self-diagnosis function result

(1) Select the C26 : DPR-150 DIAG INFO menu.
(2) To scroll the screen, turn the JOG dial.
Downward: Turn it in REVERSE (↺) direction.
Upward: Turn it in FORWARD (↻) direction.
(3) Press the MENU button to terminate the menu after checking the self-diagnosis result.

Screen display samples

In case of normal

```
 AUDIO/VIDEO CHECK MODE
C26:DPR-150 DIAG INFO

DPR-150 DIAG. OK!

 INITIAL VERIFY..
  1.SX DEC 0 INIT.     OK
  2.SX DEC 1 INIT.     OK
  3.SX DEC 2 INIT.     OK
  4.SX ENC 0 INIT.     OK
  5.SX ENC 1 INIT.     OK
  6.SX MEP   INIT.     OK
  7.SX MPEG0 INIT.     OK
  8.SX MPEG1 INIT.     OK
  9.SX MPEG2 INIT.     OK
  a.DIGI FIL INIT.     OK
  b.SDTI CP  INIT.     OK
  c.MSP MOE  INIT.     OK

 OTHERS CHECK..
 11.SX DEC 0 CHECK.    OK
 12.SX DEC 1 CHECK.    OK
 13.SX DEC 2 CHECK.    OK
 14.SX ENC 0 CHECK.    OK
 15.SX ENC 1 CHECK.    OK
 16.SX MEP   CHECK.    OK
 1a.DIGI FIL CHECK.    OK
```

In case of abnormal

```
 AUDIO/VIDEO CHECK MODE
C26:DPR-150 DIAG INFO

DPR-150 DIAG. ERROR!

 INITIAL VERIFY..
  1.SX DEC 0 INIT.     OK
  2.SX DEC 1 INIT.     OK
  3.SX DEC 2 INIT.     OK
  4.SX ENC 0 INIT.     OK
  5.SX ENC 1 INIT.     NG
  6.SX MEP   INIT.     OK
  7.SX MPEG0 INIT.     OK
  8.SX MPEG1 INIT.     OK
  9.SX MPEG2 INIT.     OK
  a.DIGI FIL INIT.     OK
  b.SDTI CP  INIT.     NG
  c.MSP MOE  INIT.     OK

 OTHERS CHECK..
 11.SX DEC 0 CHECK.    NG
     PARITY ERR   STREAM
 12.SX DEC 1 CHECK.    NG
     PARITY ERR   STREAM
 13.SX DEC 2 CHECK.    NG
     PARITY ERR   STREAM
 14.SX ENC 0 CHECK.    OK
 15.SX ENC 1 CHECK.    OK
 16.SX MEP   CHECK.    OK
 1a.DIGI FIL CHECK.    OK
```

Displays NG for failure item.

In case of NG, the detail data is displayed.

Detail description of abnormal case

INITIAL VERIFY:

The possible cause below is judged as an NG item.

- The target IC is defective.
- The foiled pattern on the board connecting target IC and SY3 CPU is defective.
- The component part between target IC and SY3 CPU is defective.

INITIAL VERIFY Screen display	Target IC	Target IC's pin number connected to SY3 CPU
1. SX DEC 0 INIT. NG	IC300	Pins 44 to 47, 53 to 59, 62
2. SX DEC 1 INIT. NG	IC400	Pins 44 to 47, 53 to 59, 62
3. SX DEC 2 INIT. NG	IC500	Pins 44 to 47, 53 to 59, 62
4. SX ENC 0 INIT. NG	IC700	Pins 128, 133 to 135, 141 to 144, 146 to 149
5. SX ENC 1 INIT. NG	IC900	Pins 128, 133 to 135, 141 to 144, 146 to 149
6. SX MEP INIT. NG	IC800	Pins 128, 134, 135, 141 to 144, 146 to 149
7. SX MPEG0 INIT. NG	IC702	Pins 122 to 125, 128 to 131, 139 to 142
8. SX MPEG1 INIT. NG	IC906	Pins 122 to 125, 128 to 131, 139 to 142
9. SX MPEG2 INIT. NG	IC606	Pins 122 to 125, 128 to 131, 139 to 142
a. DIGI FIL INIT. NG	IC603	Pins 113 to 116, 118 to 125
b. SDTI CP INIT. NG	IC30*	Pins 13, 14, 21, 111 to 113, 115, 120, 202 to 204, 288
c. MSP MOE INIT. NG	IC1000	Pins 124, 145 to 147, 154 to 157, 160, 162 to 164

*: When the DPR-150 board's board number suffix is -11, this IC CXD9139GF is IC300 on the piggybacked DIF-109 board onto the DPR-150 board.

OTHERS CHECK:

The possible cause below is judged as an ERR item.

- The target IC is defective.
- The foiled pattern on the board connecting target IC and its connected IC is defective.
- The component part between target IC and its connected IC is defective.
- Connected IC is defective.

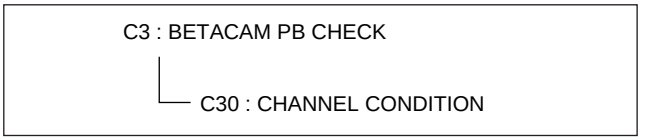
OTHERS CHECK Screen display	Target IC (Its pin number) [Ref. No. of Connected IC]
11. SX DEC 0 CHECK. NG	
SDRAM ERR ALL	IC300, [IC301]
PARITY ERR MEP	IC300 (Internal connection of IC300)
PARITY ERR STREAM	IC300 (Pins 88 to 95, 98, 112)
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC300 (Pins 99, 120 to 124, 127 to 132)

OTHERS CHECK Screen display	Target IC (Its pin number) [Ref. No. of Connected IC]
12. SX DEC 1 CHECK. NG	
SDRAM ERR ALL	IC400, [IC401]
PARITY ERR MEP	IC400 (Internal connection of IC400)
PARITY ERR STREAM	IC400 (Pins 88 to 95, 98, 112)
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC400 (Pins 99, 120 to 124, 127 to 132)
13. SX DEC 2 CHECK. NG	
SDRAM ERR ALL	IC500, [IC501]
PARITY ERR MEP	IC500 (Internal connection of IC500)
PARITY ERR STREAM	IC500 (Pins 88 to 95, 98, 112)
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC500 (Pins 99, 120 to 124, 127 to 132)
14. SX ENC 0 CHECK. NG	
PARITY ERR MEP	IC700 (Pins 165, 168 to 173, 175 to 179, 182 to 186, 189 to 192, 195 to 199), [IC800]
PARITY ERR VIDEO	IC700 (Pins 88, 89, 92 to 101, 105, 106), [IC604]
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC700 (Pins 110 to 113, 116, 121 to 127)
SDRAM ERR ALL	IC700, [IC701]
15. SX ENC 1 CHECK. NG	
PARITY ERR MEP	IC900 (Pins 165, 168 to 173, 175 to 179, 182 to 186, 189 to 192, 195 to 199), [IC800]
PARITY ERR VIDEO	IC900 (Pins 88, 89, 92 to 101, 105, 106), [IC604]
CLOCK ERR 13.5M CLOCK ERR 27M CLOCK ERR 54M CLOCK ERR 81M	IC900 (Pins 110 to 113, 116, 121 to 127)
SDRAM ERR ALL	IC900, [IC901]
16. SX MEP CHECK. NG	
SDRAM ERR ALL	IC800, [IC801]
INPUT ERR PARITY	IC800 (Pins 238 to 241, 244 to 247, 250, 251), [IC700]
INPUT ERR SYNC	IC800 (Pin 238), [IC700]
CLOCK ERR 81M CLOCK ERR 54M CLOCK ERR 27M CLOCK ERR 13.5M PLL ERR 81M PLL ERR 54M PLL ERR 27M	IC800 (Pins 107, 111 to 113, 116, 121 to 127)
17. DIGI FIL CHECK. NG	
PARITY ERR B-IN	IC603 (Pins 22 to 29, 31 to 36), [IC300]
PARITY ERR A-IN	IC603 (Pins 3 to 8, 10 to 17), [IC600, IC601, IC608, IC609]

4-2-6. BETACAM PB CHECK Mode (C3)

The C3 : BETACAM PB CHECK mode is used to check the playback RF system based on a Betacam/Betacam SP format. In this unit, one menu is available.

Menu Tree of BETACAM PB Check Mode



Note

DNW-A65's Betacam/Betacam SP PB function is for the NTSC (525/60) system. But the PAL (625/50) system can be simple playback.
DNW-A65P's Betacam/Betacam SP PB function is for the PAL (625/50) system. But the NTSC (525/60) system can be simple playback.

C30 : CHANNEL CONDITION

This menu displays the PB RF level condition of video channels (Y and C) in three steps (GRN, YEL, and RED) when the tape recorded in a Betacam/Betacam SP format is played back in the PLAY mode.

Note

If abnormality exists in the servo system, C30 : CHANNEL CONDITION menu does not function properly.

To execute the check

(1) Press the SET button.
- A white square will be displayed in the upper-right position of the superimposed display. The time data display area will operate as a ordinary time counter.
- To stop the check, press the MENU button two times.

(2) Insert a cassette tape recorded in Betacam/Betacam SP format.

(3) Press the PLAY button to playback the tape in the PLAY mode.
- ">>>" will be displayed on the superimposed display.

Note

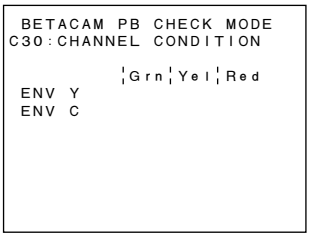
Can not be checked in other than PLAY mode.
">>>" is not displayed in playing back the portion recorded in otherwise than Betacam/Betacam SP format or the non-recorded portion.

(4) Check to see that ">>>" is displayed in the "GRN" column of Y and C channels.
- If ">>>" is displayed in columns other than "GRN", refer to "For Condition NG (C30) " on the next page.

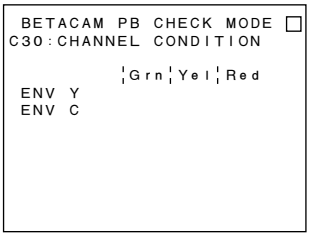
To finish the check

(5) Stop the tape playback operation and eject the cassette.
(6) Press the MENU button once.
  • The white square disappears.
    The time data display area displays the former “C30-CHANNEL COND”.
(7) To exit the menu, press the MENU button once again.

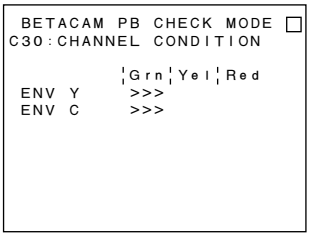
Example of display and operation



(1) ⇩ SET



(2) ⇩ Insert a recorded tape
(3) ⇩ PLAY



(4) ⇩ Check
(5) ⇩ STOP
  ⇩ EJECT
(6) ⇩ MENU

For Condition NG (C30)

Recheck according to the procedures below.

(1) Change the playback portion on the tape.
(2) Recheck in the menu C30.
  When no abnormality is found, the recheck is completed.
(3) Clean the drum for five seconds using a cleaning tape according to Section 5-2-1.
(4) Recheck in the menu C30.
  When no abnormality is found, the recheck is completed.
(5) Clean the drum for fifteen seconds using the cleaning tape again.
(6) Recheck in the menu C30.
  When no abnormality is found, the recheck is completed.
(7) Clean the drum (video heads) with a cleaning cloth according to Sections 5-2-2 and 5-2-3
(8) Recheck in the menu C30.
  When no abnormality is found, the recheck is completed.

If the condition is not improved in the way mentioned above, the possible cause below are considered.

Abnormality on PB tape

• The tape is damaged.
• The tape cannot be recorded properly.

Abnormality in this unit

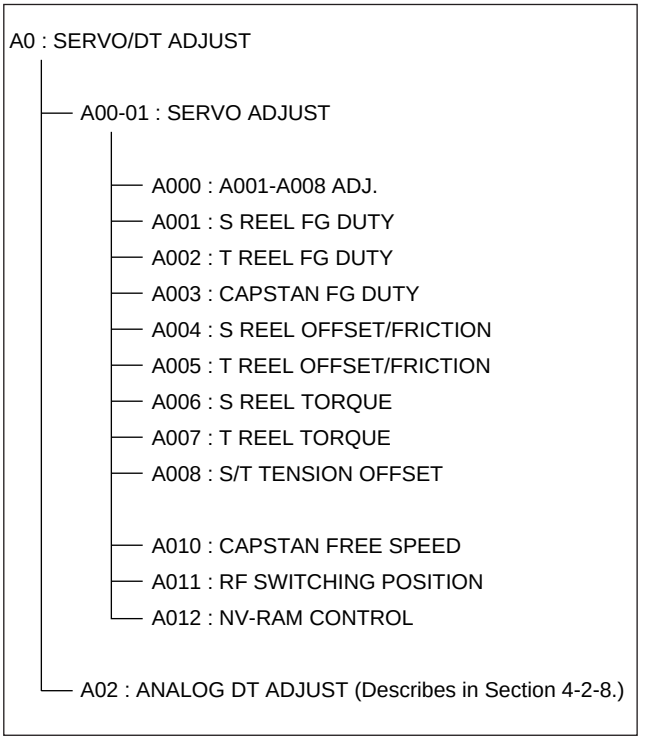
• Analog Betacam PB system adjustment defect
  ⇨ Readjust the analog Betacam PB system (A3 : BETACAM PB ADJUST)
  Perform the same adjustments at the replacement of the DM-89 board. (Refer to Section 2-11 in the maintenance manual part 2, volume-1.)
• In the tape transport system, adjustment defect or component part installation defect
  ⇨ Readjust the tape transport system or reinstall the part. (Refer to the maintenance manual part 2, volume-1.)
• Worm PB head
  ⇨ After checking the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.
  (Refer to the maintenance manual part 2, volume-1.)
• Drum assembly defect
• EQ-75C board defect

4-2-7. SERVO ADJUST Mode (A00-01)

The A00-01 : SERVO ADJUST menu is used to adjust the servo system.

Note

In the SERVO ADJUST mode, only the menu number is displayed in a time data display area. (A00-01 is displayed as A00.)

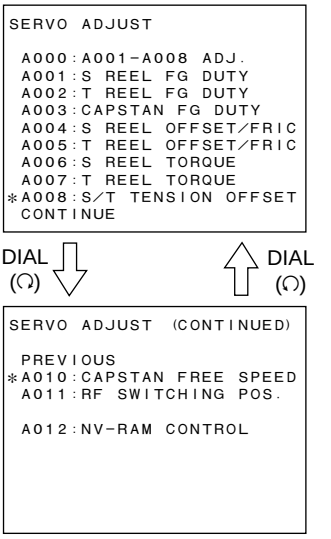

A0 : SERVO/DT ADJUST
A00-01 : SERVO ADJUST
A000 : A001-A008 ADJ.
A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET
A010 : CAPSTAN FREE SPEED
A011 : RF SWITCHING POSITION
A012 : NV-RAM CONTROL
A02 : ANALOG DT ADJUST (Describes in Section 4-2-8.)

Note

When the unit has a cassette tape, the cassette tape is automatically ejected on shifting to any lower-level menu from the A00-01 : SERVO ADJUST menu.

A00-01 : SERVO ADJUST

In the A00-01 : SERVO ADJUST menu, the whole menu cannot be displayed on the superimposed display at a time. Therefore, the display is divided into the menu selection screen of A000 to A008 and the menu selection screen of A010 and later. The menu selection screen is automatically switched when the search dial is turned.



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A000 : A001-A008 ADJ.

This menu is used to execute the adjustment menus below automatically and continuously.

A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET

To execute the adjustment menu

(1) Press the SET button to initiate the automatic adjustment.
- The execution time is about 150 seconds.
- During the adjustment, the adjustment menu name in execution and a message “ADJUSTING.....” will be displayed on the superimposed display, and a message “ADJUST COMPLETE” will be momentarily displayed on completing each adjustment. Only the menu number will be displayed in a time data display area.
- If the auto adjustment fails, a message “# ADJUST INCOMPLETE #” will be displayed halfway. In this case, refer to the “For Automatic Adjustment Failure (A000 to A011)” on page 4-45.

(2) Check the adjustment result.
- When all adjustments are completed normally, the message “ADJUST COMPLETE” is continuously displayed .

(3) To exit the menu, press the MENU button once.

(4) To save the adjustment data into the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in A012 : NV-RAM CONTROL menu.

Example of display and operation

Superimposed display / Time data display area

```
SERVO ADJUST
A001-008:AUTO ADJUST
```
A000

(1) ⇩ [SET]

```
SERVO ADJUST
A001-008:AUTO ADJUST

A001:S REEL FG DUTY
   ADJUSTING.....
```
A001

⇩

```
SERVO ADJUST
A001-008:AUTO ADJUST

A002:T REEL FG DUTY
   ADJUSTING.....
```
A002

⇩

(omitted)

⇩

```
SERVO ADJUST
A001-008:AUTO ADJUST

A008:S/T TENSION OFFSET
   ADJUSTING.....
```
A008

⇩

```
SERVO ADJUST
A001-008:AUTO ADJUST

A008:S/T TENSION OFFSET
   ADJUST COMPLETE
```
A000

(2) ⇩ Check
(3) ⇩ [MENU]
(4) ⇩ Data save

```
*A012:NV-RAM CONTROL
```

```
SERVO ADJUST
A001-008:AUTO ADJUST

 A006:S REEL TORQUE

 # ADJUST INCOMPLETE #
 # S REEL TROUBLE    #
```

Ex.: When failing the automatic adjustment

A001 : S REEL FG DUTY
A002 : T REEL FG DUTY
A003 : CAPSTAN FG DUTY
A004 : S REEL OFFSET/FRICTION
A005 : T REEL OFFSET/FRICTION
A006 : S REEL TORQUE
A007 : T REEL TORQUE
A008 : S/T TENSION OFFSET

These menus are used to perform the automatic adjustments below.

A001 : S reel FG duty adjustment
A002 : T reel FG duty adjustment
A003 : Capstan FG duty adjustment
A004 : S reel offset/friction adjustment
A005 : T reel offset/friction adjustment
A006 : S reel torque adjustment
A007 : T reel torque adjustment
A008 : S/T tension offset adjustment

To execute the automatic adjustments

(1) Press the SET button to initiate the automatic adjustment.
- The execution time is about fifteen seconds for A001 to A003 and about twenty seconds for others.
- During the adjustment, the adjustment menu name in execution and a message “ADJUSTING.....” will be displayed on only the superimposed display.

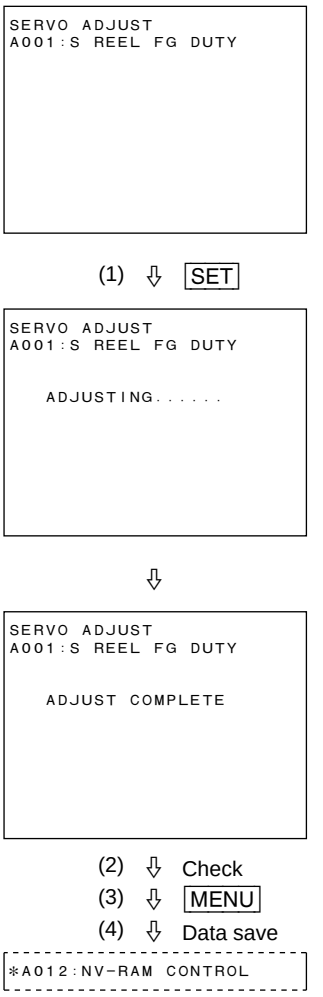
(2) Check the adjustment result.
- On completing the automatic adjustment, a message “ADJUST COMPLETE” will be displayed.
  If the automatic adjustment fails, a message “# ADJUST INCOMPLETE #” will be displayed. In this case, refer to the “For Automatic Adjustment Failure (A000 to A011)” on page 4-45.

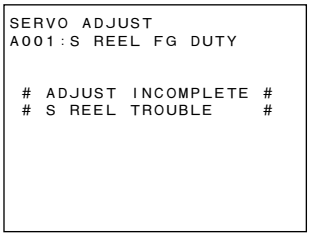
(3) To exit the menu, press the MENU button once.

(4) To save the adjustment data into the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in A012 : NV-RAM CONTROL menu.

Example of display and operation

Example of A001 : S REEL FG DUTY





Ex.: When failing the automatic adjustment

A010 : CAPSTAN FREE SPEED

This menu is used to perform the automatic adjustment of a capstan free speed.

Note

It is necessary to perform this adjustment in both 525/60 and 625/50 systems for both Betacam SX and Betacam SP formats.

To execute the adjustment menu

(1) Insert an alignment tape matched with each system and format.

For 525/60 system: SR2-1 (Betacam SX format)
CR2-1B (Betacam SP format)

For 625/50 system: SR2-1P (Betacam SX format)
CR2-1B PS (Betacam SP format)

- The adjustment is initiated on inserting the alignment tape.
- During the automatic adjustment, a message "ADJUSTING....." will be displayed on only the superimposed display.

Notes

- Be sure to use the specified alignment tape.
  If the specified alignment tape is not used, the adjustment cannot be properly performed even if a message "ADJUST COMPLETE" is displayed on completing the adjustment.
- To complete the check, the inserted alignment tape requires the continuous playback-able portion more than a check execution time.
  The adjustment execution time is usually about fifteen seconds.

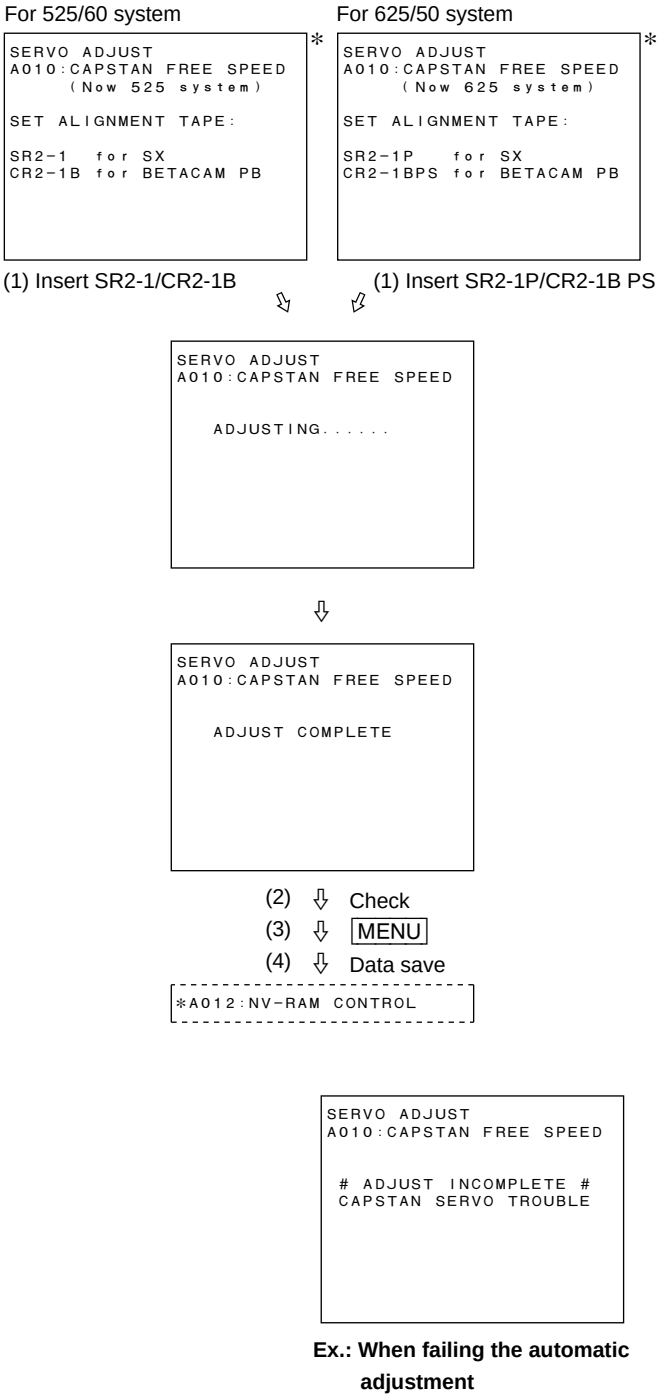
(2) Check the adjustment result.

- On completing the automatic adjustment, the message "ADJUST COMPLETE" will be displayed. If the automatic adjustment fails, a message "# ADJUST INCOMPLETE #" will be displayed. In this case, refer to the "For Automatic Adjustment Failure (A000 to A011)" on page 4-45.

(3) To exit the menu, press the MENU button once.

(4) To save the adjustment data into the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in A012 : NV-RAM CONTROL menu.

Example of display and operation



Ex.: When failing the automatic adjustment

Note

*: This message is displayed when SV1 ROM version is 1.20 and higher. When it is earlier than 1.20, the message "SET SR2-1 ALIGNMENT TAPE AND PUSH PLAY KEY" is displayed. However, it is not necessary to press the PLAY button.

A011 : RF SWITCHING POS.

This menu is used to adjust the RF switching position automatically or manually. Only the automatic adjustment is described below.

Notes

- It is not necessary to perform this adjustment in both 525/60 and 625/50 systems. On performing it in either system, the other system is automatically updated.
- Alignment tape SR2-1 (for 525/60 system) or SR2-1P (for 625/50 system) located in the beginning of time code 00:25:00:00 in advance is required for this adjustment. If the specified alignment tape is not used, the adjustment cannot be properly performed even if a message "ADJUST COMPLETE" is displayed on completing the adjustment.

To execute the automatic adjustment

(1) Check to see that an ∗ mark is assigned to "AUTO" on the superimposed display.
  - If the ∗ mark is assigned to "MANUAL", turn the search dial to set the mark to "AUTO".
  - In a time data display area, the automatic adjustment (AUTO) will be displayed as "A0110", and the manual adjustment (MANUAL) will be displayed as "A0111".

(2) Press the SET button.

(3) Insert the alignment tape SR2-1 or SR2-1P located in beginning of time code 00:25:00:00.
  - The adjustment is initiated on inserting the alignment tape.
  - During the automatic adjustment, a message "ADJUSTING....." will be displayed on only the superimposed display.

(4) Check the adjustment result.
  - On completing the automatic adjustment, the message "ADJUST COMPLETE" will be displayed and the alignment tape will automatically be ejected. If the automatic adjustment fails, a message "# ADJUST INCOMPLETE #" will be displayed. In this case, refer to the "For Automatic Adjustment Failure (A000 to A011)" on next page.

(5) To exit the menu, press the MENU button once.

(6) To save the adjustment data into the NV-RAM of a servo system, execute the SAVE SERVO ADJUST DATA in A012 : NV-RAM CONTROL menu.

Example of display and operation

Superimposed display / Time data display area

```
SERVO ADJUST
A011:RF SWITCHING POS.

∗AUTO
 MANUAL

    PG DATA:BDF5
```

Time data display area: A0110

(1) ⇩ SET

```
SERVO ADJUST
A011:RF SWITCHING POS.

 SET
 SR2-1
 ALIGNMENT TAPE
 TC 00:25:00:00

    PG DATA:C000
```

Time data display area: A011

(2) ⇩ Insert SR2-1/SR2-1P

```
SERVO ADJUST
A011:RF SWITCHING POS.

   ADJUSTING.....

    PG DATA:BFFF
```

Time data display area: A011

⇩

```
SERVO ADJUST
A011:RF SWITCHING POS.

   ADJUST COMPLETE

    PG DATA:BDF7
```

Time data display area: A011

(3) ⇩ Check
(4) ⇩ MENU
(5) ⇩ Data save

```
∗A012:NV-RAM CONTROL
```

```
SERVO ADJUST
A011:RF SWITCHING POS.

 # ADJUST INCOMPLETE #

    PG DATA:C000
```

EX.: When failing the automatic adjustment

For Automatic Adjustment Failure (A000 to A011)

The circuit in which failure occurred can be traced to some degree by the trouble message displayed together when message "# ADJUST INCOMPLETE #" is displayed during execution of adjustment menus A000 to A011.

Note

The trouble message display indicates that no adjustment could be performed because the circuit described in this manual did not operate normally. Moreover, other circuits (e.g., control signal system) in which failure actually occurred may also exist.

A000 : A000-A008 ADJUST

Refer to the description of A001 to A008.

A001 : S REEL FG DUTY

When "S REEL FG AMP TROUBLE" is displayed:

⇨ Check the S reel FG amplifier circuit on the MS-58 board.

When "S REEL DRIVER TROUBLE" is displayed:

⇨ Check the S reel motor driver circuit on the DR-315 board.

A002 : T REEL FG DUTY

When "T REEL FG AMP TROUBLE" is displayed:

⇨ Check the T reel FG amplifier circuit on the MS-58 board.

When "T REEL DRIVER TROUBLE" is displayed:

⇨ Check the T reel motor driver circuit on the DR-315 board.

A003 : CAPSTAN FG DUTY

When "CAPSTAN FG AMP TROUBLE" is displayed:

⇨ Check the capstan FG amplifier circuit on the MS-58 board.

⇨ Check the capstan motor driver circuit on the DR-315 board.

A004 : S REEL OFFSET/FRICTION
A006 : S REEL TORQUE

When "# S REEL TROUBLE #" is displayed in these menus:

⇨ Execute the S reel FG duty adjustment (A001 : S REEL FG DUTY) again.

⇨ Check the S reel motor driver circuit on the DR-315 board.

A005 : T REEL OFFSET/FRICTION
A007 : T REEL TORQUE

When "# T REEL TROUBLE #" is displayed:

⇨ Execute the T reel FG duty adjustment (A002 : T REEL FG DUTY) again.

⇨ Check the T reel motor driver circuit on the DR-315 board.

A008 : S/T TENSION OFFSET

When "S REEL DRIVER TROUBLE" is displayed:

⇨ Check the S tension detection circuit on the MS-58 board.

⇨ Check the S reel motor driver circuit on the DR-315 board.

When "T REEL DRIVER TROUBLE" is displayed:

⇨ Check the T tension detection circuit on the MS-58 board.

⇨ Check the T reel motor driver circuit on the DR-315 board.

A010 : CAPSTAN FREE SPEED

Check to see that the played back tape is the following alignment tape.

SR2-1 (for 525/60 system of Betacam SX)
SR2-1P (for 625/50 system of Betacam SX)
CR2-1B (for 525/60 system of Betacam SP)
CR2-1B PS (for 625/50 system of Betacam SP)

When "CAPSTAN SERVO TROUBLE" is displayed:

⇨ Execute the capstan FG duty adjustment (A003 : CAPSTAN FG DUTY) again.

⇨ Check the capstan FG amplifier circuit and CTL amplifier circuit on the MS-58 board.

When "CAPSTAN DRIVER TROUBLE" is displayed:

⇨ Check the capstan motor driver circuit on the DR-315 board.

A011 : RF SWITCHING POS.

Check to see that the played back tape is the following alignment tape.

SR2-1 (for 525/60 system of Betacam SX)
SR2-1P (for 625/50 system of Betacam SX)

A012 : NV-RAM CONTROL

This menu is used to save the servo adjustment data adjusted in the SERVO ADJUST mode into the NV-RAM of a servo system.

CAUTION

Do not save the adjustment data into the NV-RAM when abnormality is found during automatic adjustment (when the message "# ADJUST INCOMPLETE #" is displayed).

Note

When the power is turned off without saving the adjusted data, the adjustment data returns to the former saved data.

To execute the data save

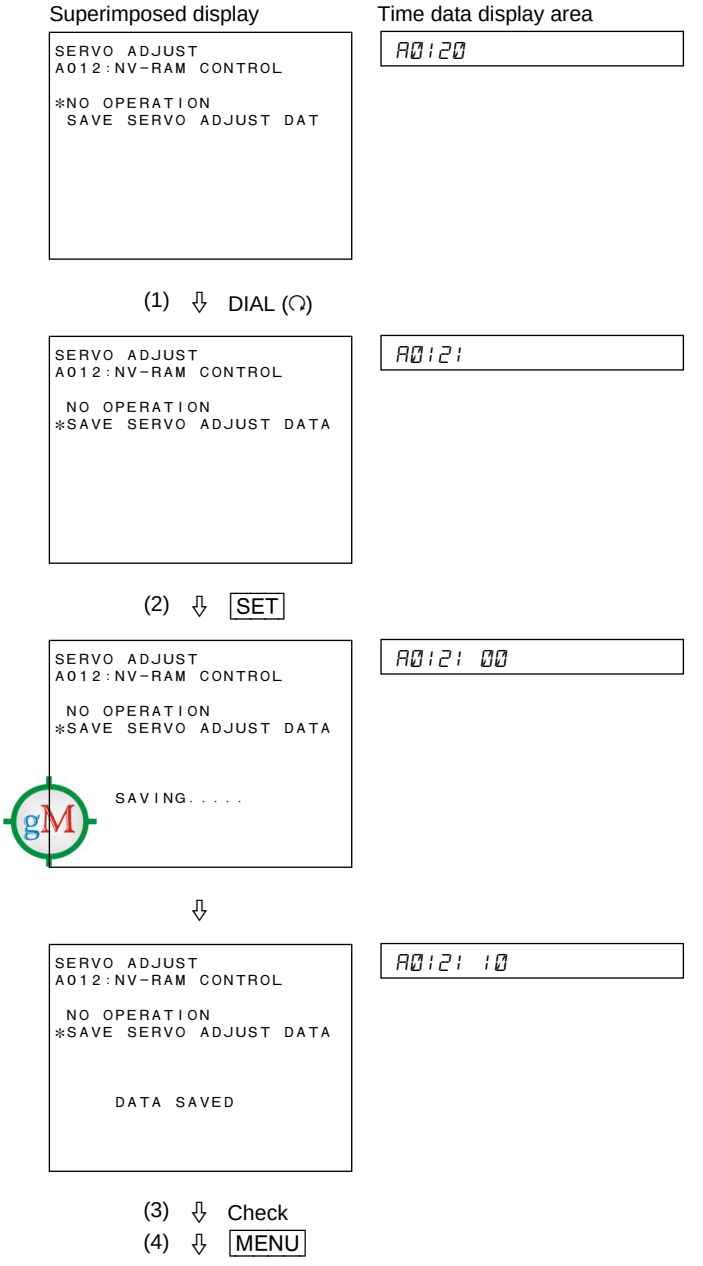
(1) Turn the search dial to set the ∗ mark to "SAVE SERVO ADJUST DATA" on the superimposed display.
- In a time data display area, NO OPERATION will be displayed as "A0120", and SAVE SERVO ADJUST DATA will be displayed as "A0121".

(2) Press the SET button to execute the data save.
- On pressing it, the data transmission is initiated. The data transmission time is about ten seconds.
- During the data transmission, a message "SAVING....." will be displayed on the superimposed display, and "A0121 00" will be displayed in the time data display area.

(3) Check to see that the data transmission is completed.
- On completing the data transmission, a message "DATA SAVED" will be displayed on the superimposed display and "A0121 10" will be displayed in the time data display area.

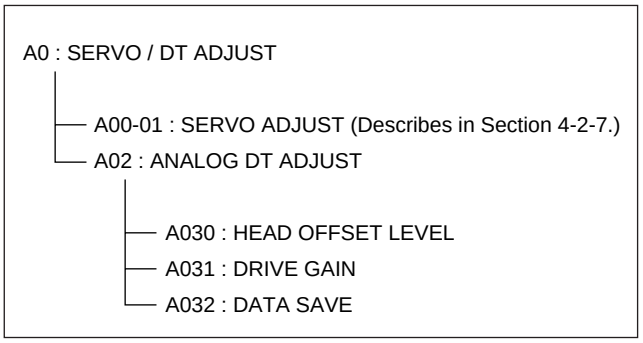
(4) To exit the menu, press the MENU button once.

Example of display and operation



4-2-8. ANALOG DT ADJUST Mode (A02)

The A02: ANALOG DT ADJUST mode is used to adjust the DT system. Three menus are available.


A0 : SERVO / DT ADJUST
A00-01 : SERVO ADJUST (Describes in Section 4-2-7.)
A02 : ANALOG DT ADJUST
A030 : HEAD OFFSET LEVEL
A031 : DRIVE GAIN
A032 : DATA SAVE

Menu Tree of Analog DT System Adjustment Mode

A030 : HEAD OFFSET LEVEL

This menu is used to adjust the offset levels of DT heads for analog Betacam playback. Only the automatic adjustment is described below.

Notes

- It is necessary to perform this adjustment in both 525/60 and 625/50 systems.
- It is required the following alignment tape located in the beginning of color-bar portion in advance.

To execute the adjustment

(1) Prepare the following alignment tape located in the beginning of the color-bar portion.
In 525/60 system: CR5-1B (TC 00:00:14:00) or CR5-2A (TC 00:00:00:00)
In 625/50 system: CR5-1B PS (TC 00:00:14:00) or CR5-2A PS (TC 00:00:00)

(2) Insert the cassette tape into this unit.

(3) Check to see that an ∗ mark is assigned to “Start auto adjust” on the superimposed display.
- If the ∗ mark is not assigned to “Start auto adjust”, turn the search dial to set the mark to “Start auto adjust”.

(4) Press the SET button once.
- On pressing it, a message “Push PLAY button” will be displayed on the superimposed display.

(5) Press the PLAY button to initiate the automatic adjustment in the PLAY mode.
- During the automatic adjustment, a message “ADJUSTING.....” will be displayed.

(6) Check the result of checking.
- On completing the automatic adjustment, a message “ADJUST COMPLETE” will be displayed.
- If the automatic adjustment fails, a message “# ADJUST INCOMPLETE #” is displayed. In this case, refer to “When failing the automatic adjustment” on the next page.

(7) To exit the menu, press the MENU button once.

(8) To save the adjustment data into the NV-RAM of a DT system, execute the SAVE ANALOG DT DATA in A032 : DATA SAVE menu.

Note

The alignment tape will automatically be ejected in returning to the A0 : SERVO/DT ADJUST mode picture.

Example of display and operation

```
    ANALOG DT ADJUST
A030:HEAD OFFSET LEVEL
     MODE : PLAY

*Start auto adjust
 Ach manual adjust
 Bch manual adjust



  Ach:00     Bch:00
```

(1)(2) ⇩ Insert the alignment tape
(3) ⇩ DIAL(↺)
(4) ⇩ [SET]

```
    ANALOG DT ADJUST
A030:HEAD OFFSET LEVEL
     MODE : PLAY

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   Push PLAY button


  Ach:00     Bch:00
```

(5) ⇩ [PLAY]

```
    ANALOG DT ADJUST
A030:HEAD OFFSET LEVEL
     MODE : PLAY

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUSTING.....


  Ach:00     Bch:00
```

⇩

```
    ANALOG DT ADJUST
A030:HEAD OFFSET LEVEL
     MODE : PLAY

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUST COMPLETE


  Ach:01     Bch:FF
```

(6) ⇩ Check
(7) ⇩ [MENU]
(8) ⇩ Data save

```
*A032:DATA SAVE
```

When failing the automatic check

If the message "# ADJUST INCOMPLETE #" is displayed during the automatic adjustment, perform the following check.

(1) Perform C060: SG LOOP CHECK of C04: ANALOG DT CHECK. (Refer to Section 4-2-3.)
(2) Adjust again. If the automatic adjustment fails, perform step (3).
(3) Confirm that "Y RF ENVELOPE" signal exists at the test terminal TP2700 on the SS-83 board.
  - Not exist; Confirm the DM-89 board.
  - Exists; Confirm the SS-83 board.

```
    ANALOG DT ADJUST
A030:HEAD OFFSET LEVEL
     MODE : PLAY

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

 # ADJUST INCOMPLETE #
     Ach

  Ach:00     Bch:00
```

Ex.: When failing the automatic adjustment

A031 : DRIVE GAIN

This menu is used to adjust the drive gain of an analog DT susyem for analog Betacam playback. Only the automatic adjustment is described below.

Notes

- It is necessary to perform this adjustment in both 525/60 and 625/50 systems.
- It is required the following alignment tape located in the beginning of color-bar portion in advance.

To execute the adjustment

(1) Prepare the following alignment tape located in the beginning of the color-bar portion.
  In 525/60 system: CR5-1B (TC 00:00:14:00) or CR5-2A (TC 00:00:00:00)
  In 625/50 system: CR5-1B PS (TC 00:00:14:00) or CR5-2A PS (TC 00:00:00)

(2) Insert the cassette tape into this unit.

(3) Check to see that an ∗ mark is assigned to “Start auto adjust” on the superimposed display.
  - If the ∗ mark is not assigned to “Start auto adjust”, turn the search dial to set the mark to “Start auto adjust”.

(4) Press the SET button once.
  - On pressing it, a message “Set VARIABLE × 3” will be displayed on the superimposed display.

(5) Press the VAR button to enter the VARIABLE mode.
  - The VAR button lights.

(6) Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE +3 times normal speed mode.
  - On entering the VARIABLE +3 times normal speed mode, the automatic adjustment is initiated.
  - During the automatic adjustment, a message “ADJUSTING.....” will be displayed.

(7) Check the result of checking.
  - On completing the automatic adjustment, a message “ADJUST COMPLETE” will be displayed.
  - If the automatic adjustment fails, a message “# ADJUST INCOMPLETE #” is displayed. In this case, refer to “When failing the automatic adjustment” on the next page.

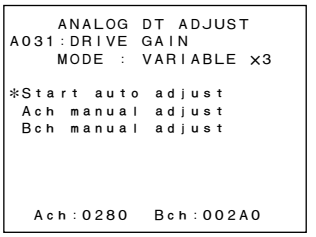
(8) To exit the menu, press the MENU button once.

(9) To save the adjustment data into the NV-RAM of a DT system, execute the SAVE ANALOG DT DATA in A032 : DATA SAVE menu.

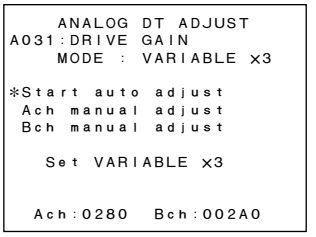
Note

The alignment tape will automatically be ejected in returning to the A0 : SERVO/DT ADJUST mode picture.

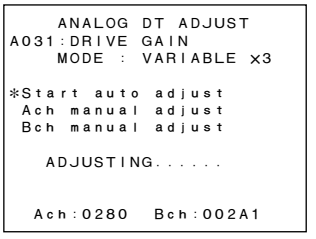
Example of display and operation



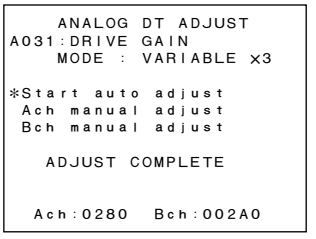
(1)(2) ⇩ Insert the alignment tape
(3) ⇩ DIAL(↻)
(4) ⇩ [SET]



(5)(6) ⇩ [VAR], DIAL(↻)



⇩



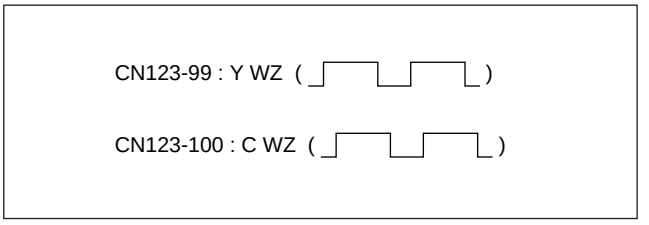
(7) ⇩ Check
(8) ⇩ [JOG]
(9) ⇩ [MENU]
(10) ⇩ Data save

When failing the automatic check

If the message "# ADJUST INCOMPLETE #" is displayed during the automatic adjustment, perform the following check.

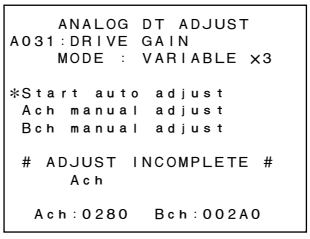
(1) Perform C060: SG LOOP CHECK of C04: ANALOG DT CHECK. (Refer to Section 4-2-3.)
(2) Adjust again. If the automatic adjustment fails, perform step (3).
(3) Confirm that the signal at pins 99 and 100 of CN123 on the SS-83 board are synchronized.

• The no signals exist or are synchronized:



⇨ Confirm the DM-89, TBC-23A/24 and EQ-75C board.

• The signal exists and are synchronized:
⇨ Confirm the SS-83 board.



Ex.: When failing the automatic adjustment

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A032 : DATA SAVE

This menu is used to save the adjustment data adjusted in the ANALOG DT ADJUST mode into the NV-RAM of the DT system.

CAUTION

Do not save the adjustment data into the NV-RAM when abnormality is found during automatic adjustment (when the message "# ADJUST INCOMPLETE #" is displayed).

Note

When the power is turned off without saving the adjusted data, the adjustment data returns to the former saved data.

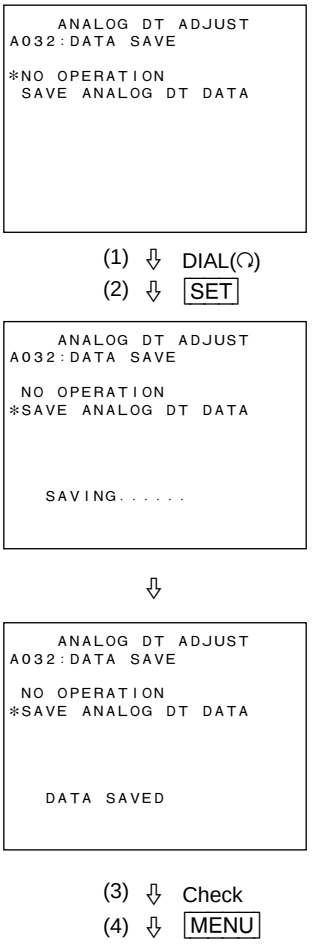
To execute the data save

(1) Turn the search dial to set the ✻ mark to "SAVE ANALOG DT DATA" on the superimposed display.
(2) Press the SET button to execute the data save.
- On pressing it, the data transmission is initiated.
- During the data transmission, a message "SAVING....." will be displayed on the superimposed display.

(3) Check to see that the data transmission is completed.
- On completing the data transmission, a message "DATA SAVED" will be displayed on the superimposed display.

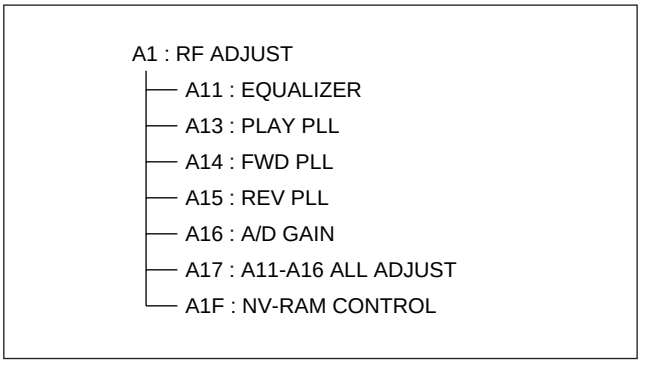
(4) To exit the menu, press the MENU button once.

Example of display and operation



4-2-9. RF ADJUST Mode (A1)

The A1 : RF ADJUST mode is used to adjust the RF system.
Seven menus are available.



Menu Tree of RF System Adjustment Mode

Note

If abnormally exists in the servo system, each menu in A1 : RF ADJUST mode does not function properly.

A11 : EQUALIZER
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN

These menus are used to perform the automatic adjustments below.

A11 : EQUALIZER

This menu automatically adjusts the PB RF levels (VC) and PB equalizers' gain (EQ) and phase (PH) for the PB heads (channels A1, A2, A5, A6, B1, B2, B5, and B6).

A13 : PLAY PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for PLAY mode.

A14 : FWD PLL

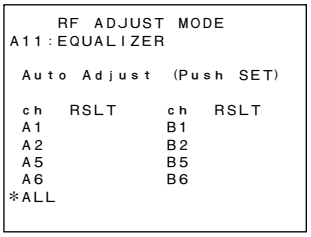
This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for F FWD mode.

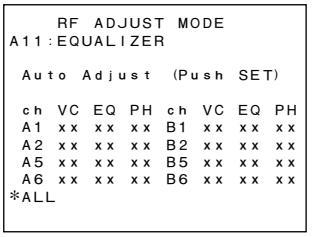
A15 : REV PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for REV mode.

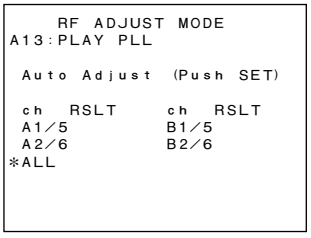
A16 : A/D GAIN

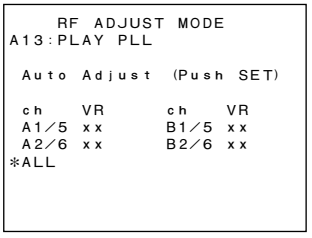
This menu automatically adjusts the gain in converting a PB RF signal from analog to digital.



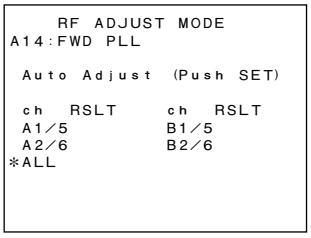

RF ADJUST MODE
A11:EQUALIZER
Auto Adjust (Push SET)
ch VC EQ PH ch VC EQ PH
A1 xx xx xx B1 xx xx xx
A2 xx xx xx B2 xx xx xx
A5 xx xx xx B5 xx xx xx
A6 xx xx xx B6 xx xx xx
*ALL

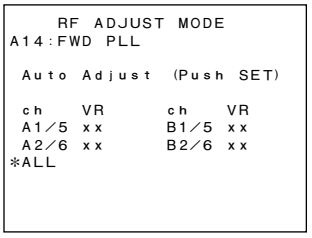
A11 : EQUALIZER



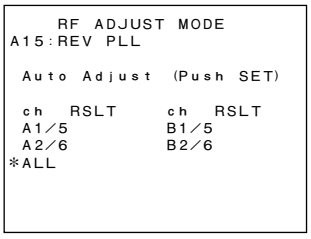


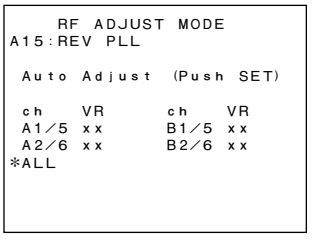
A13 : PLAY PLL



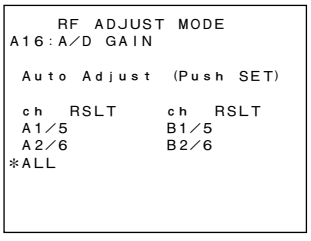


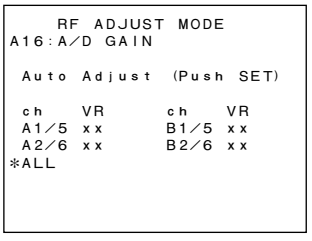
A14 : FWD PLL





A15 : REV PL



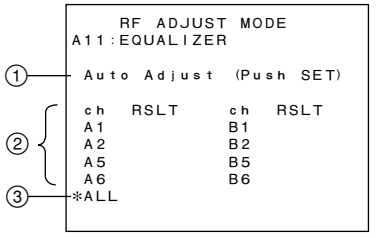


A16 : A/D GAIN

Note

Right side displays are examples while pressing the STOP button.
Actually, each adjustment data is displayed at the “xx” portion.

Description of superimposed display



Ex. A11 : EQUALIZER

① The display in this line changes. Each display and its meaning are described below.

Auto Adjust(Push SET) :	Press the SET button to initiate the automatic adjustment.
Insert SR5-1 :	Insert an alignment tape.
Auto Tracking ... :	Tracking is in an optimization process.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.
Condition NG :	Error condition defect.

② To perform the automatic adjustment for single channel (circuit), select a channel name using an ∗ mark.
The adjustment result (OK, NG, or FAIL) will be displayed on the right of the channel name.
"OK": When the channel can be adjusted normally
"NG": If the error condition of the channel is bad
"FAIL": If the automatic adjustment fails

Note

"RSLT" indicates the result.

The adjustment data in each channel (circuit) is displayed while pressing the STOP button except in adjusting.

Note

Do not press the STOP button in adjusting. If pressing it in adjusting, the tape stops and the automatic adjustment becomes impossible.

③ To perform the automatic adjustment for all channels (circuit) at a time, select "ALL" using the ∗ mark.
During the check, the adjustment result in each channel is displayed in area ②.
After the automatic adjustment in all channels is completed, the adjustment result (OK, NG, or FAIL) will be displayed on the right of "ALL".
"OK": When all channels (circuits) are "OK"
"NG": If both "NG" and "OK" occur in channels
"FAIL": If one or more "FAIL" occur in channels

To execute the adjustment

(1) Insert the specified cassette tape.

Notes

- Be sure to use the specified alignment tape.
  If the specified cassette tape is not used, the adjustment cannot be properly performed even if the message "Auto Adjust Complete" is displayed on completing the adjustment. Insert alignment tape SR5-1 (for 525/60 system) or SR5-1P (for 625/50 system).
- Take care that the tape transport mode does not change during automatic adjustment.
  Any adjustment cannot be properly performed in modes other than tape transport that was set automatically. Moreover, in modes other than tape transport, the automatic adjustment cannot be performed any longer or "FAIL" or "NG" is displayed as the adjustment result. Therefore, pay attention to the transport start position of the tape so that the end and beginning of the tape are not detected during adjustment. The minimum tape amount required for normal automatic adjustment is shown in the table on the next page. However, the tape amount increases or decreases when abnormality occurs.

Menu	Ordinary adjustment time	Tape amount required (Transport mode)
A11 : EQUALIZER Ⓣ	About 2 min./ALL, about 15 sec./channel	Adjustment time (PLAY)
A13 : PLAY PLL	About 12 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)
A14 : FWD PLL	About 10 sec.	About 10 min. (F FWD)
A15 : REV PLL	About 10 sec.	About 11 min. (REV)
A16 : A/D GAIN Ⓣ	About 90 sec./ALL, about 10 sec./circuit	Adjustment time (PLAY)

In a menu with Ⓣ, tracking operation is performed.

(2) Turn the search dial to set the ∗ mark to the channel to be adjusted or ALL.
- Usually, select ALL.

(3) Press the SET button to initiate the automatic adjustment.
- The automatic adjustment is initiated after automatically running the tape.
- During the automatic adjustment, the message “Auto Tracking ...” (only a menu in which tracking operation is performed) or “Auto Checking ...” will be displayed.

Note

When executing ALL adjustment in the menu in which tracking operation is carried out, the adjustment result of the channel is displayed every time one-channel (circuit) adjustment is completed.
- The time data display area displays an ordinary time counter.
- To cancel the automatic adjustment, press the MENU button once.
- When no cassette tape is inserted, the message “Insert SR5-1” will be displayed.
  In this case, insert the specified tape. The adjustment is then initiated after automatically running the tape.

Notes
- If the message “Auto Adjust (Push SET)” is continuously displayed, the non-recorded portion on the tape is judged to be played back. Set the tape position to the beginning of recorded portion. Change the playback position on the tape.
- Keep the unit until automatic adjustment is completed. Any adjustment cannot be properly performed if the tape transport state is changed by touching some button or search dial. In this case, the adjustment freezes or the adjustment result becomes “FAIL” or “NG”.

(4) Check to see the result of automatic adjustment on the superimposed display.
- If no abnormality is found, “OK” will be displayed on the right of the selected channel (circuit) or “ALL”.
- If “Condition NG” or “Auto Adjust Failure” is displayed, refer to the “For Condition NG/Automatic Adjustment Failure” on page 4-59.
- To see the adjustment data, press the STOP button.

Note

“OK”, “NG”, or “FAIL” is also displayed in the time data display area.
The adjustment result for each channel (circuit) is displayed in the time data display area on turning the search dial after completing ALL adjustment.

(5) To exit the menu, press the MENU button once.
To execute the automatic adjustment again in this menu, go to step (2).

(6) To save the adjustment data into the NV-RAM of an RF system, execute SAVE ALL ADJUST DATA in A1F : NV-RAM CONTROL menu.
To return the adjustment data to the former saved data before adjustment, execute ALL DATA PREVIOUS in A1F : NV-RAM CONTROL menu.

Note

Do not save the adjustment data into NV-RAM when abnormality is found during automatic adjustment (When the message “Auto Adjust Failure” or “Condition NG” is displayed).

Example of display and operation

Ex.: When ALL is selected in A11 : EQUALIZER

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust (Push SET)

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
*ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Tracking ...

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
*ALL
```

⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjusting .......

 ch   RSLT     ch   RSLT
 A1            B1
 A2            B2
 A5            B5
 A6            B6
*ALL
```

⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A1    OK      B1
 A2            B2
 A5            B5
 A6            B6
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE
A11:EQUALIZER

 Auto Adjust Complete

 ch   RSLT     ch   RSLT
 A1    OK      B1    OK
 A2    OK      B2    OK
 A5    OK      B5    OK
 A6    OK      B6    OK
*ALL   OK
```

(4) ⇩ Check
(5) ⇩ MENU
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

Ex.: When ALL is selected in A13 : PLAY PLL

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust (Push SET)

 ch   RSLT     ch   RSLT
 A1/5          B1/5
 A2/6          B2/6
*ALL
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ Select
(3) ⇩ SET

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjusting

 ch   RSLT     ch   RSLT
 A1/5          B1/5
 A2/6          B2/6
*ALL
```

⇩

```
    RF ADJUST MODE
A13:PLAY PLL

 Auto Adjust (Push SET)

 ch   RSLT     ch   RSLT
 A1/5 OK       B1/5 OK
 A2/6 OK       B2/6 OK
*ALL   OK
```

(4) ⇩ Check
(5) ⇩ MENU
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

A17 : A11-A16 ALL ADJUST

This menu executes the automatic adjustment of A11 to A16 described previously in the following order.

A13: PLAY PLL
A16: A/D GAIN
A11: EQUALIZER
A14: FWD PLL
A15: REV PLL

To execute the automatic adjustment

(1) Insert an alignment tape SR5-1 (for 525/60 system) or SR5-1P (for 625/50 system) rewound to the tape top.
Note
Be sure to use the specified alignment tape.
If the specified cassette tape is not used, the adjustment cannot be properly performed.
(2) Press the SET button to initiate the automatic adjustment.
- The automatic adjustment is initiated after automatically running the tape.
- The superimposed display during the automatic adjustment is displayed in the same way as when each adjustment is independently executed.
- The adjustment for a PB system is completed in about five to six minutes unless the message “Condition NG” or “Auto Adjust Failure” is displayed.
- On completing the adjustment for the PB system, the alignment tape stops with rewound to the tape top.

(3) Eject the alignment tape.
(4) Check to see that the message “Auto Adjust Complete” is displayed on the superimposed display.
- When seeing the adjustment data, perform in each menu.

Note

If abnormality exists during adjustment, message “Condition NG” or “Auto Adjust Failure” is displayed in the same way as when the adjustment is executed independently. The automatic adjustment stops in the adjustment menu. In the time data display area, a message “A17-ALL FAIL” or “A17-ALL NG” is displayed.

- If the message “Condition NG” or “Auto Adjust Failure” is displayed, refer to the “For Condition NG/Automatic Adjustment Failure” on page 4-59.
- To check the adjustment data, press the STOP button.

(5) To exit the menu, press the MENU button once.
- To execute readjustment, press the MENU button once, then select the menu again.

(6) To save the adjustment data into the NV-RAM of an RF system, execute SAVE ALL ADJUST DATA in A1F : NV-RAM CONTROL menu.
To return the adjustment data to the former saved data before adjustment, execute ALL DATA PREVIOUS in A1F : NV-RAM CONTROL menu.
Note
Do not save the adjustment data into the NV-RAM when abnormality is found during automatic adjustment (when the message “Auto Adjust Failure” or “Condition NG” is displayed).

Example of display and operation

Superimposed display

```
RF ADJUST MODE
A17:A11-A16 ALL ADJUST

 Auto Adjust (Push SET)
```

Time data display area

```
A17-PUSH SET BTN
```

(1) ⇩ Insert SR5-1/SR5-1P
(2) ⇩ SET

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST
 A13:PLAY PLL
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1/5        B1/5
 A2/6        B2/6
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE      □
A17:A11-A16 ALL ADJUST
 A16:A/D GAIN
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1/5        B1/5
 A2/6        B2/6
*ALL
```

⇩
(omitted)
⇩

```
    RF ADJUST MODE      □
A17:A10-A16 ALL ADJUST
 A11:EQUALIZER
 Auto Adjusting

 ch  RSLT    ch  RSLT
 A1          B1
 A2          B2
 A5          B5
 A6          B6
*ALL
```

(3) ⇩ EJECT

```
    RF ADJUST MODE
A17:A11-A16 ALL ADJUST

 Auto Adjust Complete
```

```
A17-ALL OK
```

(4) ⇩ Check
(5) ⇩ SET
(6) ⇩ Data save

```
*A1F:NV-RAM CONTROL
```

For Condition NG/Automatic Adjustment Failure

Recheck according to the procedures below when the massage “Condition NG” or “Auto Adjust Failure” is displayed in the adjustment menu (A11 to A17).

(1) Confirm whether the specified alignment tape is used. If the specified alignment tape is not used, execute the automatic adjustment by the specified one.
SR5-1 for 525/60 system, SR5-1P for 625/50 system
When no abnormality is found, the readjustment is completed.
(2) Clean the drum (video heads) according to the “For Condition NG (C11)” in “4-2-4. RF CHECK Mode (C1)”. This operation is not required when the drum has been already cleaned.
(3) When message “Condition NG” or “Auto Adjust Failure” is displayed during execution of menus other than menu A17 or A13, perform the menu A17.
When no abnormality is found, the readjustment is completed.

If the message “Condition NG” is displayed, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  ⇨ Readjust the servo system. (A00-01 : SERVO ADJUST)
  ⇨ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  ⇨ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  ⇨ After checking the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required. (Refer to the maintenance manual part 2, volume-1.)
- In the tape transport system adjustment defect or component part installation defect
  ⇨ Readjust the tape transport system or reinstall the part. (Refer to the maintenance manual part 2, volume-1.)
- EQ-75C board defect or Drum assembly defect

Or if the message “Auto Adjust Failure” is displayed, the possible above and following cause are considered.

- Brush slip ring assembly defect or its part installation/ connection defect
  ⇨ Replace or reinstall the brush slip ring assembly. (Refer to the maintenance manual part 2, volume-1.)
- Harness (between the EQ-75C board and drum assembly) connection defect

A1F : NV-RAM CONTROL

This menu is used to save the RF adjustment data adjusted in the RF ADJUST mode into the NV-RAM of the RF system. The adjustment data of A30 : EQ VR adjusted in the BETACAM PB ADJUST mode is also saved in this menu.
The current adjustment data can return to the former saved data before adjustment when executing ALL DATA PREVIOUS without saving the adjustment data into the NV-RAM.

CAUTION

Do not save the adjustment data into the NV-RAM when abnormality is found during automatic adjustment (when the message “Auto Adjust Failure” or “ Condition NG”is displayed).

Note

When the power is turned off without saving the adjusted data, the adjustment data returns to the former saved data.

To execute the menu

(1) Turn the search dial to set the ✻ mark on the superimposed display as described below.
To save the adjustment data after adjustment:
⇨ “SAVE ALL ADJUST DATA”
To return the adjustment data before adjustment:
⇨ “ALL DATA PREVIOUS”
  - In the time data display area, a message “SAVE ALL ADJUST” or “ALL DATA PREVIOU” will be displayed, respectively.

(2) Press the SET button once.
  - On pressing it, the data transmission is initiated.
  - On the superimposed display, a message “Saving ...” or “Loading ...” will be displayed.
    In the time data display area, a message “SAVING” or “LOADING” will be displayed.

(3) Check to see that the data transmission is completed.
  - On completing the data transmission:
    On the superimposed display, a message “Save Complete.” or “Load Complete” will be displayed.
    In the time data display area, a message “SAVING” or “LOADING” will be displayed.

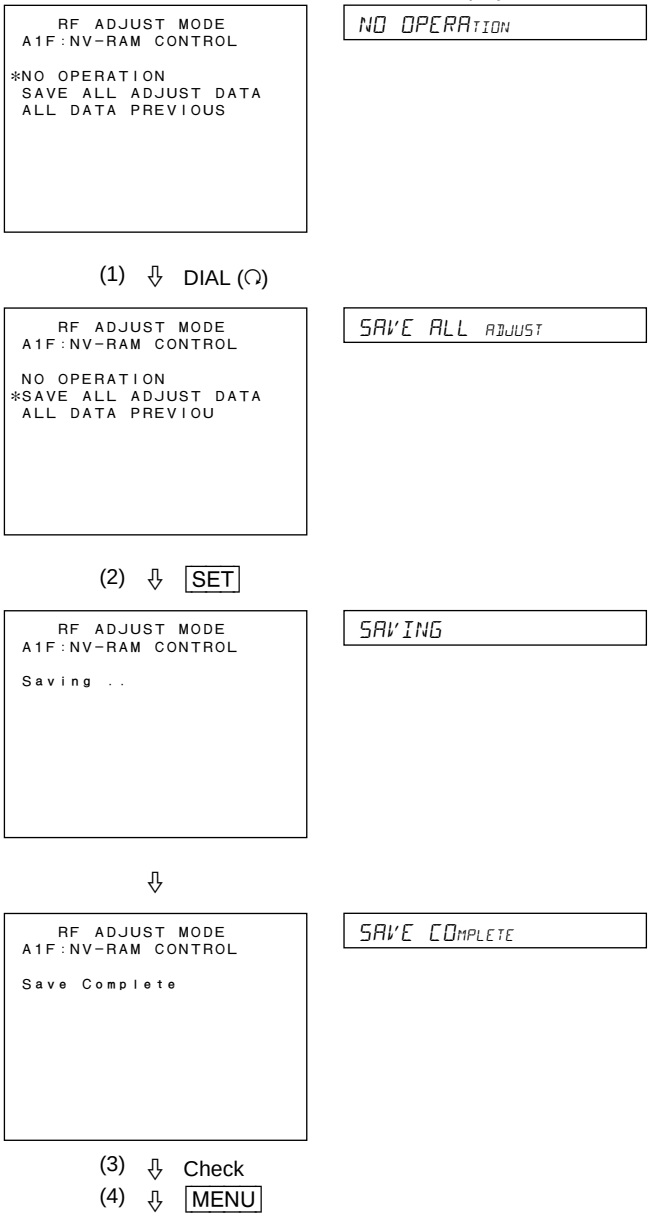
(4) To exit the menu, press the MENU button once.

Example of display and operation

(In data save)

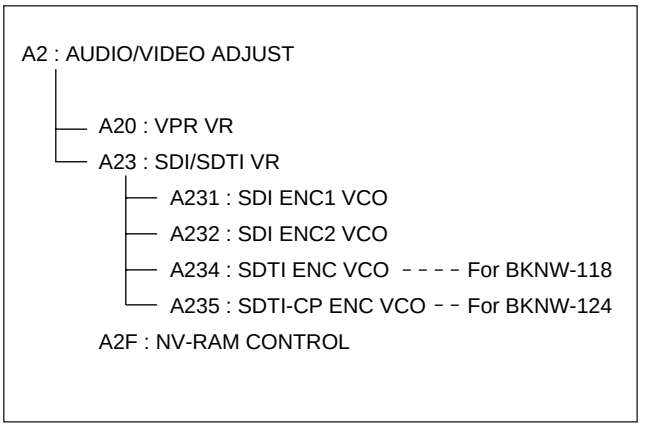
Superimposed display

Time data display area



4-2-10. AUDIO/VIDEO ADJUST Mode (A2)

The A2 : AUDIO/VIDEO ADJUST mode is used to adjust the audio and video systems.
This unit has eight menus.
In an A23 : SDI/SDTI VR menu, three submenus (including the submenu displayed when the option is installed) are available.


A2 : AUDIO/VIDEO ADJUST
A20 : VPR VR
A23 : SDI/SDTI VR
A231 : SDI ENC1 VCO
A232 : SDI ENC2 VCO
A234 : SDTI ENC VCO ---- For BKNW-118
A235 : SDTI-CP ENC VCO -- For BKNW-124
A2F : NV-RAM CONTROL

Menu Tree of Audio/Video Systems Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in the maintenance manual part 2, volume-1.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in A2F : NV-RAM CONTROL menu or turn off the power of this unit without selecting A2F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

http://getMANUAL.com

The adjustment menus of menu A20 are used for manual adjustment.
In the submenus of A23, automatic adjustment (AUTO) or manual adjustment (MANUAL) can be selected.
For the automatic adjustment, refer to the operation example described in menu A23.

To change the adjustment data manually

(1) When seeing on the superimposed display, turn the search dial to set the ∗ mark to the item to be adjusted. When seeing in the time data display area, turn the search dial to display the item to be adjusted.
(2) To increase or decrease the adjustment data, turn the search dial while pressing the JOG button.

To execute the automatic adjustment

(1) When seeing on the superimposed display, turn the search dial to set the ∗ mark to “MANUAL”. When seeing in the time data display area, turn the search dial to display “MANUAL”.
(2) Turn the search dial in FORWARD (↻) direction while pressing the JOG button to display a message “Auto (Push SET Button)” on the superimposed display or a message “PUSH SET” in the time data display area.
(3) Press the SET button once to initiate the automatic adjustment.
- Only the display on the superimposed display changes as described below. The displayed data value also changes.

  Auto adjusting .. : Automatic adjustment is in progress.
  Auto Adjust Complete : Automatic adjustment is completed.
  Auto Adjust Failure : Automatic adjustment fails.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in A2F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former saved data after executing SAVE ALL DATA ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in A2F : NV-RAM CONTROL menu.

A20 : VPR VR

```
AUDIO/VIDEO ADJUST MODE
A20:VPR VR

*REF 1ST FLD DET      80
 VIDEO 1/2 LEVEL      80
 VIDEO 3 LEVEL        80
 Y OUTPUT LEVEL       80
 R-Y OUTPUT LEVEL     80
 B-Y OUTPUT LEVEL     80
 B-CAM R-Y OUT LEVEL  80
 B-CAM B-Y OUT LEVEL  80
 INT 4FSC FREQ        80
```

In 525/60 System

```
AUDIO/VIDEO ADJUST MODE
A20:VPR VR

*REF 1ST FLD DET      80
 VIDEO 1/2 LEVEL      80
 VIDEO 3 LEVEL        80
 Y OUTPUT LEVEL       80
 R-Y OUTPUT LEVEL     80
 B-Y OUTPUT LEVEL     80
 INT 4FSC FREQ        80
```

In 625/50 System

This menu is used to adjust the reference signal and analog video output systems on the VPR-47 board. In 525/60 and 625/50 systems, the displayed adjustment items differ.

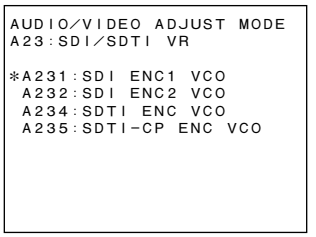
The adjustment item below must be adjusted in both 525/60 and 625/50 systems.

Adjustment item	Description
REF 1ST FLD DET	First-field detection timing of reference signal
VIDEO 1/2 LEVEL	Composite video output (1/2) level
VIDEO 3 LEVEL	Composite video output (3) level
Y OUTPUT LEVEL	Component video Y output level
R-Y OUTPUT LEVEL	Component video R-Y output level
B-Y OUTPUT LEVEL	Component video B-Y output level
INT 4FSC FREQ	Free-running frequency of internal reference signal 4fsc

The adjustment item below is used exclusively for the 525/60 system.

Adjustment item	Description
B-CAM R-Y OUT LEVEL	R-Y output (Betacam) level
B-CAM B-Y OUT LEVEL	B-Y output (Betacam) level

A23 : SDI/SDTI VR



This menu is used to adjust the VCO free-running frequency of SDI and SDTI input/output interfaces.
Five submenus (including for option) are available.
Automatic or manual adjustment can be selected.

Note

The menu title of A23 may be displayed as “SDI VR”.

A231 : SDI ENC1 VCO

This submenu is used for an SDI output interface (SDI encoder).

A232 : SDI ENC2 VCO

This submenu is used for an SDI output interface (SDI encoder) with superimpose function.

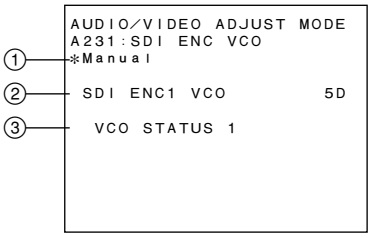
A234 : SDTI ENC VCO

This submenu is used for an SDTI (SX) output interface (SDTI (SX) encoder). This submenu is displayed when the BKNW-118 option is installed.

A235 : SDTI-CP ENC VCO

This submenu is used for an SDTI-CP output interface (SDTI-CP encoder). This submenu is displayed when the BKNW-124 option is installed.

Description of superimposed display



Ex.: A231 : SDI ENC1 VCO

① The adjustment mode (manual and automatic) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ The VCO status will be displayed as “0” or “1”.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	Superimposed display	Time data display area
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the search dial in REVERSE (↺) direction to set the * mark to line ① on the superimposed display. (In a time data display area, “MANUAL” or “PUSH SET” will be displayed.)
(ii) Turn the search dial while pressing the JOG button.
Manual ⇨ Automatic: JOG + DIAL (↺)
Manual ⇦ Automatic: JOG + DIAL (↺)

To execute the automatic adjustment

(1) Display “Auto (Push SET Button)” on the superimposed display or “PUSH SET” in the time data display area according to the “Change of adjustment mode” described above.

(2) Press the SET button to initiate the automatic adjustment.
- The superimposed display changes to “Auto Adjusting...”. The displayed data value also changes. The display in the time data display area does not change.

(3) Check to see that the automatic adjustment is completed on the superimposed display.
- On completing it, the message “Auto Adjust Complete” will be displayed.

Note

If the message “Auto Adjust Failure” is displayed, refer to the “When failing the automatic adjustment” below.

(4) To exit the menu, press the MENU button once. To execute the automatic adjustment again in this menu, go to step (2).

(5) To save the adjustment data into the NV-RAM, execute SAVE ALL ADJUST DATA in A2F : NV-RAM CONTROL menu. To return the adjustment data to the former saved data before adjustment, execute ALL DATA PREVIOUS in A2F : NV-RAM CONTROL menu.

When failing the automatic adjustment

The following circuit board is considered to be defective.

Submenu No.	Circuit board name	Remarks
A231 or A232	SDI-41C board	
A234	DPR-119 board (or SDI-41C board)	BKNW-118
A235	DPR-150 (or DIF-109) board	BKNW-124

Note on manual adjustment

Measuring equipment are required in performing the manual adjustment. For the actual manual adjustment, refer to the adjustment method described in Section 2 of the maintenance manual part 2, volume-1.

Note

For the data changing, refer to the “To change the adjustment data manually” on page 4-61.

Example of display and operation

Example of A231 : SDI ENC1 VCO

Superimposed display / Time data display area

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Manual

 SDI ENC1 VCO          74

  VCO STATUS 0
```

MANUAL

(1) ⇩ JOG + DIAL (↻)

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto  (Push SET button)

 SDI ENC1 VCO          74

  VCO STATUS 0
```

PUSH SET

(2) ⇩ SET

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto Adjusting ...

 SDI ENC1 VCO          00

  VCO STATUS 0
```

PUSH SET

⇩

(omitted)

⇩

```
AUDIO/VIDEO ADJUST MODE
A231:SDI ENC1 VCO
*Auto Adjust Complete

 SDI ENC1 VCO          5C

  VCO STATUS 1
```

PUSH SET

(3) ⇩ Check
(4) ⇩ MENU
(5) ⇩ MENU
⇩ Data save

```
*A2F:NV-RAM CONTROL
```

A2F : NV-RAM CONTROL

This menu is used to save the audio/video adjustment data adjusted in the AUDIO/VIDEO ADJUST mode into the NV-RAM.
The current adjustment data can return to the former saved data before adjustment when executing ALL DATA PREVIOUS without saving the adjustment data into the NV-RAM.

Note

When the power is turned off without saving the adjusted data, the adjustment data returns to the former saved data.

To execute the menu

(1) Turn the search dial to set the ∗ mark on the superimposed display as described below.
To save the adjustment data after adjustment:
⇨ "SAVE ALL ADJUST DATA"
To return to the adjustment data before adjustment:
⇨ "ALL DATA PREVIOUS"
- In the time data display area, a message "SAVE ALL ADJUST" or "ALL DATA PREVIOU" will be displayed, respectively.

(2) Press the SET button once.
- On pressing it, the data transmission is initiated.
- On the superimposed display, a message "Saving ..." or "Loading ..." will be displayed.
In the time data display area, a message "SAVING" or "LOADING" will be displayed.

(3) Check to see that the data transmission is completed.
- On completing the data transmission:
On the superimposed display, a message "Save Complete." or "Load Complete" will be displayed.
In the time data display area, a message "SAVING" or "LOADING" will be displayed.

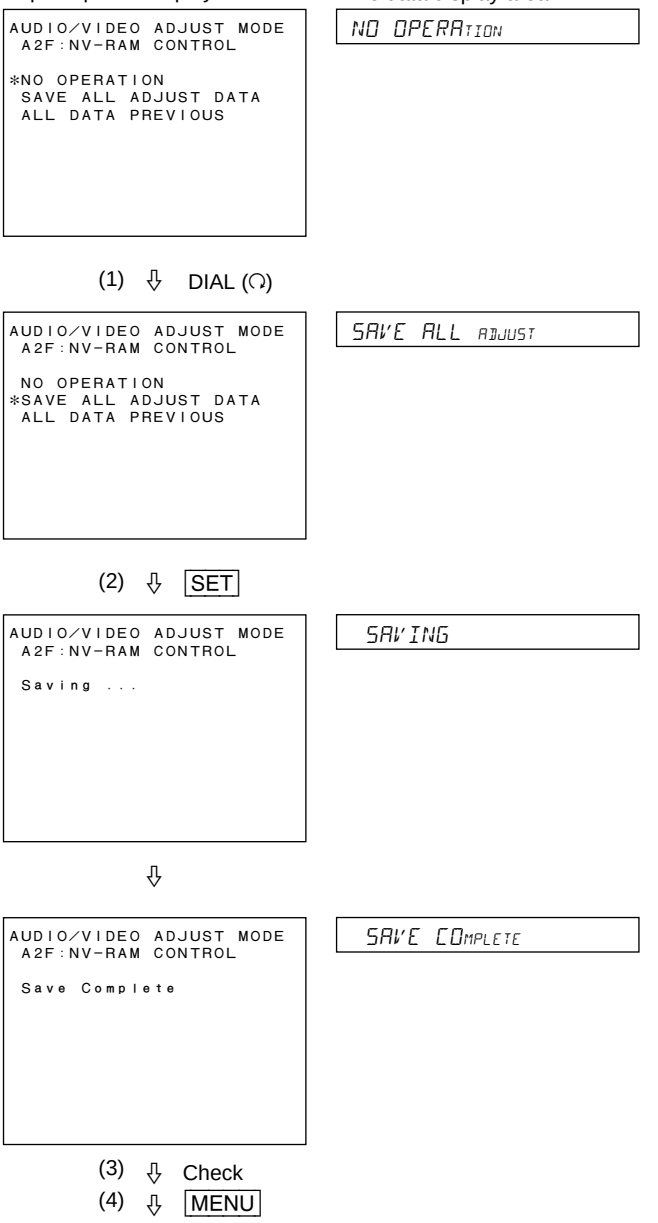
(4) To exit the menu, press the MENU button once.

Example of display and operation

(In data save)

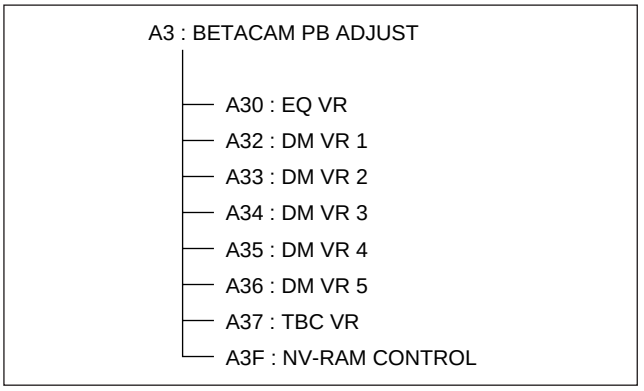
Superimposed display

Time data display area



4-2-11. BETACAM PB ADJUST Mode (A3)

The A3 : BETACAM PB ADJUST mode is used to adjust the PB system based on a Betacam/Betacam SP format. This mode contains the eight menus below.



Menu Tree of BETACAM PB Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in the maintenance manual part 2, volume-1.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in A3F : NV-RAM CONTROL menu or turn off the power of this unit without selecting A3F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

Note

DNW-A65's Betacam/Betacam SP PB function is for the NTSC (525/60) system. But the PAL (625/50) system can be simple playback.
DNW-A65P's Betacam/Betacam SP PB function is for the PAL (625/50) system. But the NTSC (525/60) system can be simple playback.

To change the adjustment data manually

(1) When seeing on the superimposed display, turn the search dial to set the ∗ mark to the item to be adjusted. When seeing in the time data display area, turn the search dial to display the item to be adjusted.
(2) To increase or decrease the adjustment data, turn the search dial while pressing the JOG button.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A3F : NV-RAM CONTROL menu.

Note

In a time data display area, the adjustment item name on the superimpose picture is omitted during display as follows:

RF GAIN ⇨ GAIN
GUARD BAND ⇨ GUARD
METAL ⇨ M
OXIDE ⇨ O

A30 : EQ VR

```
 BETACAM PB ADJUST MODE
 A30:EQ VR

*RF GAIN METAL-Y-A   58
 RF GAIN METAL-Y-B   59
 RF GAIN METAL-C-A   48
 RF GAIN METAL-C-B   4D
 RF GAIN OXIDE-Y-A   72
 RF GAIN OXIDE-Y-B   75
 RF GAIN OXIDE-C-A   5A
 RF GAIN OXIDE-C-B   5C
```

This menu is used to adjust the gain of a PB RF amplifier (on the EQ-75C board) based on the Betacam/Betacam SP format.
There are adjustment data for metal and oxide tapes. Each adjustment data is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

A32 : DM VR 1

```
BETACAM PB ADJUST MODE
A32:DM VR 1

*EQ1 METAL-Y-A        7F
 EQ1 METAL-Y-B        81
 EQ1 METAL-C-A        77
 EQ1 METAL-C-B        81
 EQ1 OXIDE-Y-A        AD
 EQ1 OXIDE-Y-B        AF
 EQ1 OXIDE-C-A        94
 EQ1 OXIDE-C-B        9D
```

This menu is used to adjust the frequency characteristics of a primary cosine equalizer (on the DM-89 board).
There are adjustment data for metal and oxide tapes.
Each adjustment data is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

A33 : DM VR 2

```
BETACAM PB ADJUST MODE
A33:DM VR 2

*MAIN METAL-Y-A       BC
 MAIN METAL-Y-B       BC
 MAIN METAL-C-A       91
 MAIN METAL-C-B       91
 MAIN OXIDE-Y-A       A8
 MAIN OXIDE-Y-B       A8
 MAIN OXIDE-C-A       A0
 MAIN OXIDE-C-B       A0
```

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (main)(on the DM-89 board).
There are adjustment data for metal and oxide tapes.
Each adjustment data is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

A34 : DM VR 3

```
BETACAM PB ADJUST MODE
A34:DM VR 3

*SUB METAL-Y-A        A4
 SUB METAL-Y-B        A4
 SUB METAL-C-A        70
 SUB METAL-C-B        70
 SUB OXIDE-Y-A        B6
 SUB OXIDE-Y-B        B6
 SUB OXIDE-C-A        AA
 SUB OXIDE-C-B        AA
```

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (sub)(on the DM-89 board).
There are adjustment data for metal and oxide tapes. Each adjustment data is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

A35 : DM VR 4

```
BETACAM PB ADJUST MODE
A35:DM VR 4

*GUARD BAND METAL-Y   22
 GUARD BAND METAL-C   1A
 GUARD BAND OXIDE-Y   26
 GUARD BAND OXIDE-C   2F
 OMC DC METAL-Y       E4
 OMC DC METAL-C       D0
 OMC DC OXIDE-Y       D0
 OMC DC OXIDE-C       D0
```

This menu is used to adjust the guard band width and to set the DC offset level of an over-modulation compensation circuit (on the DM-89 board).
There are adjustment data for metal and oxide tapes. Each adjustment data is provided proportionally to the number of video channels (Y and C).

A36 : DM VR 5

```
BETACAM PB ADJUST MODE
A36:DM VR 5

*DO TH METAL-Y        1A
 DO TH METAL-C        12
 DO TH OXIDE-Y        2E
 DO TH OXIDE-C        27
 ENV-TH-H             20
 ENV-TH-L             10
```

This menu is used to adjust each dropout threshold level of Y and C channels and to set the RF envelope threshold level.
There are adjustment data for metal and oxide tapes provided for each dropout threshold level.
There are adjustment data for high (H) and low (L) limits provided for the RF envelope threshold level.

A37 : TBC VR

```
BETACAM PB ADJUST MODE
A37:TBC VR

*SQ-Y RZ              4B
 SQ-C RZ              6F
 VISC PHASE           06
```

This menu is used to set each read clock timing of Y and C channels and to set the data of a PB VISC phase detection circuit (on the TBC-23A board).

A3F : NV-RAM CONTROL

This menu is used to save the Betacam PB adjustment data adjusted in the BETACAM PB ADJUST mode into the NV-RAM.
The current adjustment data can return to the former saved data before adjustment when executing “ALL DATA PREVIOUS” without saving the adjustment data into the NV-RAM.

Note

When the power is turned off without saving the adjusted data, the adjustment data returns to the former saved data.

To execute the menu

(1) Turn the search dial to set the ∗ mark on the superimposed display as described below.
To save the adjustment data after adjustment:
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment:
⇨ “ALL DATA PREVIOUS”
- In the time data display area, a message “SAVE ALL ADJUST” or “ALL DATA PREVIOU” will be displayed, respectively.

(2) Press the SET button once.
- On pressing it, the data transmission is initiated.
- On the superimposed display, a message “Saving ...” or “Loading ...” will be displayed.
In the time data display area, a message “SAVING” or “LOADING” will be displayed.

(3) Check to see that the data transmission is completed.
- On completing the data transmission:
On the superimposed display, a message “Save Complete.” or “Load Complete” will be displayed.
In the time data display area, a message “SAVING” or “LOADING” will be displayed.

(4) To exit the menu, press the MENU button once.

Example of display and operation

(In data save)

Superimposed display

```
BETACAM PB ADJUST MODE
A3:NV-RAM CONTROL

*NO OPERATION
 SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```

Time data display area: NO OPERATION

(1) ⇩ DIAL (↺)

```
BETACAM PB ADJUST MODE
A3:NV-RAM CONTROL

 NO OPERATION
*SAVE ALL ADJUST DATA
 ALL DATA PREVIOUS
```

Time data display area: SAVE ALL ADJUST

(2) ⇩ SET

```
BETACAM PB ADJUST MODE
A3:NV-RAM CONTROL

Saving ...
```

Time data display area: SAVING

⇩

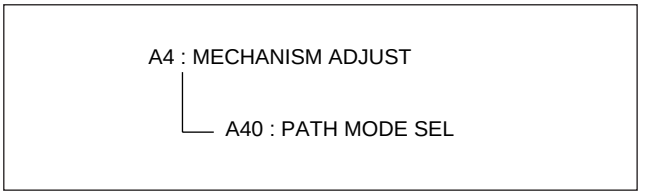
```
BETACAM PB ADJUST MODE
A3:NV-RAM CONTROL

Save Complete
```

Time data display area: SAVE COMPLETE

(3) ⇩ Check
(4) ⇩ MENU

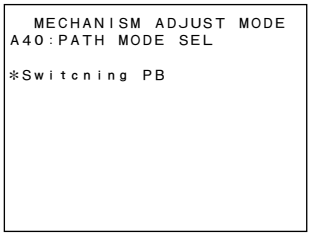
4-2-12. MECHANISM ADJUST Mode (A4)

The A4 : MECHANISM ADJUST mode is used to adjust the mechanism. This mode contains the one menu below.



Menu Tree of MECHANISM Adjustment Mode

A40 : PATH MODE SEL



This menu sets the PB mode for confirming and adjusting video tracking. Switching PB and full PB modes are available for setting.
A PB signal is output to the test point (TP106) on the SS-83 board by the ADV A2 head when the tape is played back with this menu opened. (The signal output from this test point becomes an envelope waveform.)
In the switching PB mode, only the data area (helical track) based on an SX format is played back.
In the full PB mode, the overlap portion before and behind the data area based on an SX format is played back.
The switching PB mode is always set when the menu is opened.

PB mode setting

To set the PB mode, turn the search dial while pressing the JOG button and display the desired setting.

Menu operation

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pressed after the switching PB and full PB modes are set. The unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed.)
In this state, play back the specified alignment tape, and confirm and adjust the video tracking.
However, character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

Note

For the video tracking confirmation and adjustment, refer to “4-1-3. Video Tracking Confirmation and Adjustment” in the maintenance manual part 2, volume-1.

4-2-13. LTC REC ADJUST Mode (A5)

The A5 : LTC REC ADJUST mode is used to record the LTC when adjusting the shot mark recording circuit.

To execute

(1) Insert the cassette tape recorded by Betacam SX format.
- The message “Record start (Push SET)” is displayed on the superimposed display.
  The message “PUSH SET” is displayed on the time data display area.

Notes
- Use the cassette tape of the same video system (525/625) as the unit which is adjusted.
- Check that the remainder of a cassette tape have enough amount.

(2) Press the SET button.
- The recording starts automatically and the REC/ERASE indicator illuminates.
- The message “Recording” is displayed on the super imposed display.

Note
- The message “Insert Tape” is displayed when the cassette tape is not inserted in this unit. The recording starts automatically when the cassette tape is inserted.
  The time data display area displays an ordinary time counter

(3) Perform the adjustment.
- Refer to the maintenance manual part 2 volume-1 for the adjustment method.

(4) Press the STOP button after completing the adjustment.
- The message “Record stop” is displayed on the superimposed display.

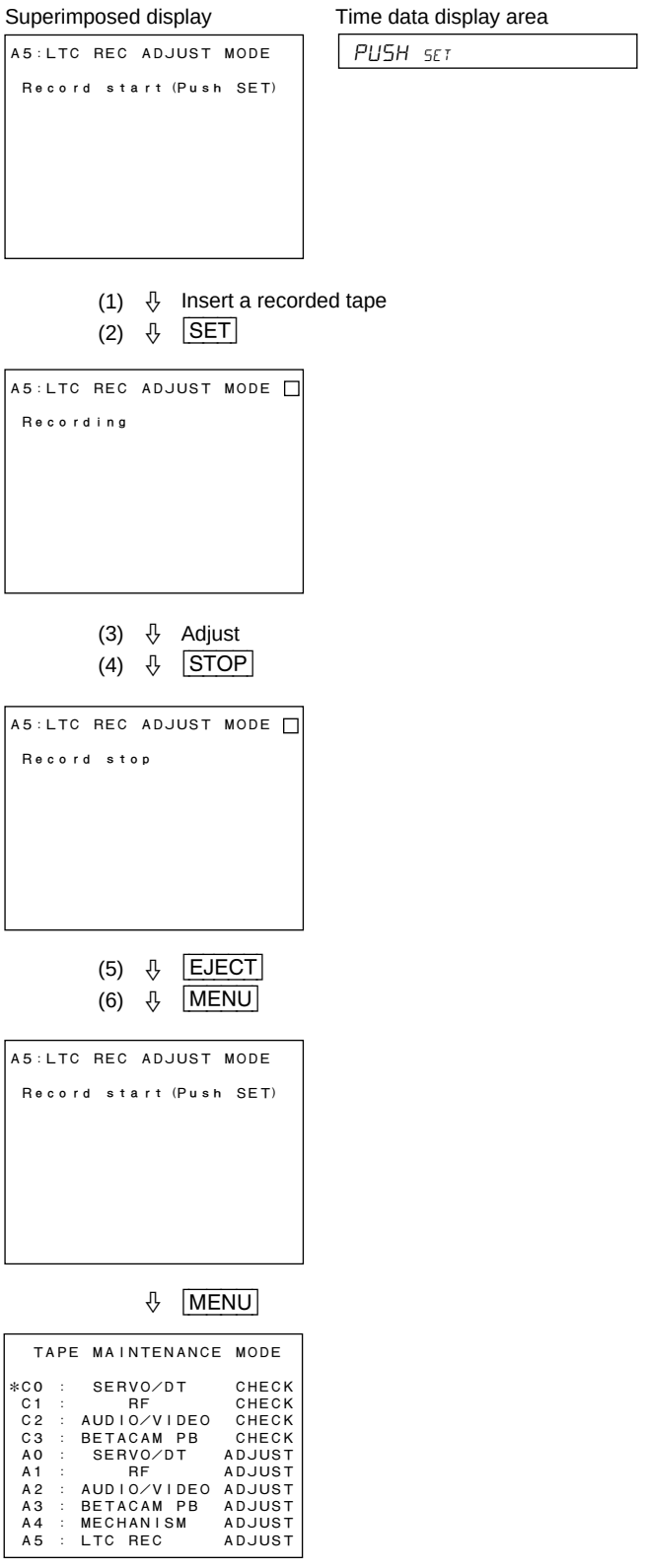
(5) Eject the cassette tape.

(6) Press the MENU button twice to exit A5:LTC REC ADJUST mode.

Note

When the cassette tape has ended during adjusting, the recording stops and the cassette tape is automatically rewound.
When restarting the adjustment, press the SET button after pressing the MENU button once to display the message “Record start (PUSH SET)” on the superimposed display.

Example of display and operation



4-3. Error Logger Display Mode (M2)

4-3-1. Outline

This unit has an error log function that records the error generated or detected in this unit.
The error logger display mode is used to superimpose the contents (data) of the error log on the video monitor. The ordinary display mode (refer to Section 4-3-2) and the setting mode (refer to Section 4-3-3) that displays the menu to limit the error log display are available in this unit.
The calendar/clock date incorporated into this unit can be set in the setting mode.

Activation and Termination

The two methods below are used to activate the error logger display mode. To terminate the error logger display mode, press the MENU button in the display mode. It returns to the operation state before activation when the error logger display mode is terminated.

A. Select an M2 : ERROR LOGGER menu in the maintenance mode.
B. Press the MENU button while pressing the ENTRY button on the lower control panel during ordinary operation.

Error Log

The recorded error log is classified into three categories: TAPE ERROR, WARNING, and CONDITION. (The error log belongs to the three types.)
Each log is constituted by a message, error generation date, and time code.
The message varies depending on the type of a log.
The error generation date is the date based on the calendar and clock of this unit. (The year is omitted.)
The time code records the time code (LTC) data of the VTR side which is stored in this unit at the error occurs.

The maximum number of stored log is 300. If the number of log exceeds 300, the contents of oldest error log is erased sequentially.

TAPE ERROR

An error code and error message are recorded as a message when the error (error codes 01 to 99) related to a VTR and system occurs.
When multiple sub-error messages are displayed, the three sub-error messages from the top are recorded.
For the error message, refer to Section 3.

WARNING

The warning log below is recorded in an error log.

- REFERENCE MISSING
  This message is recorded when no signal is input to the REF VIDEO (reference video signal) connector after the power is turned on.

CONDITION

The condition logs below are recorded in an error log.

- VIDEO PB CONDITION RED
  This message is recorded when the channel condition becomes red during video PB operation.
- AUDIO PB CONDITION RED
  This message is recorded when the channel condition becomes red during audio PB operation.

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4-3-2. Display Mode

The operation in the ordinary display mode is described based on a display example on the superimposed display. The log number/total log count is displayed in the second line. "(001/000)" is displayed when no log exists.
The third to tenth lines (eight lines) are the area where logs are displayed. The three-digit number on the left indicates the log number. The contents of a log are displayed on its right.
A calendar/clock is displayed on the lowest line.

Notes

- The top screen on the right is the example displayed when the error logger mode is first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- In a time data display area, only the log number/total log count (e.g., "ERR LOG 001/003") is displayed.

Search dial (JOG mode)

To display the log number not displayed on the screen, turn the search dial and move an ∗ mark.

CTL/TC/UB button

On this screen, the whole message is displayed partially. To display other information (date and time code), press the CTL/TC/UB button.

F FWD button

The whole contents of a log to which the ∗ mark was set are displayed while the F FWD button is pressed.
The category (error code for TAPE ERROR) of an error log is displayed in the third line. Messages are displayed in the fourth and fifth lines, and sub-error messages in the sixth to eighth lines. The date (not including the year) is displayed in the ninth line, and time code in the tenth line.
Other logs can be displayed in this display state when the search dial is turned with the F FWD button pressed.

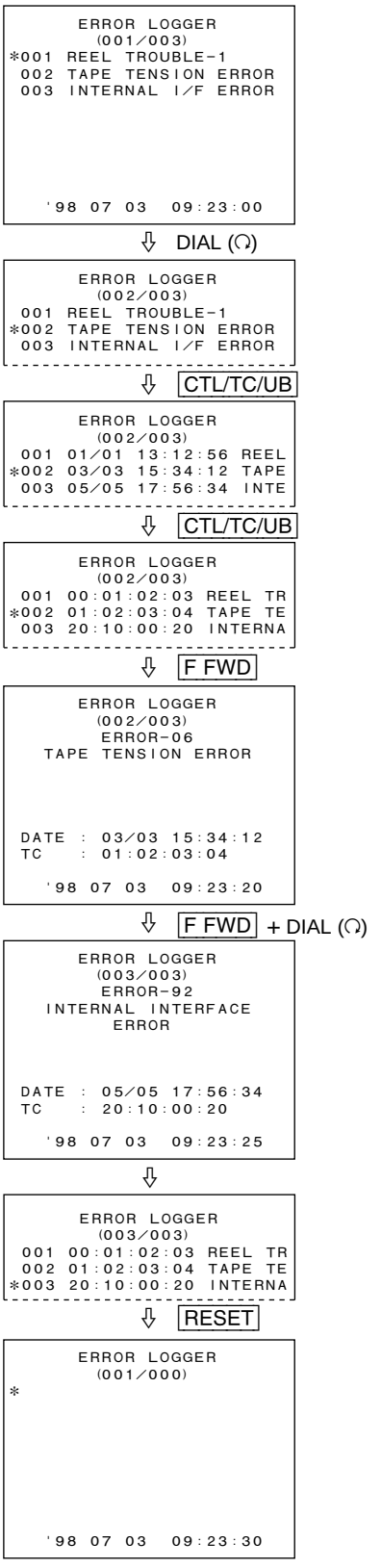
RESET button

The recorded all logs are erased when the RESET button is pressed.

Note

Usually, do not erase any log.
There may be some error logs that are useful for confirmation of the progress when a trouble occurs or that are important in preventing a trouble from occurrence.

Example of display and operation



SET button

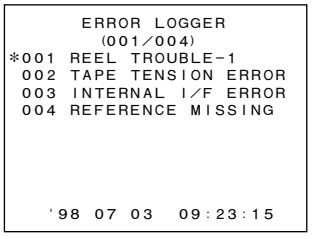
A white square mark is displayed in the upper-right position of the superimposed display when the SET button is pressed. The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during normal operation is not displayed in this case.
To return to the former state, press the MENU button.

MENU button

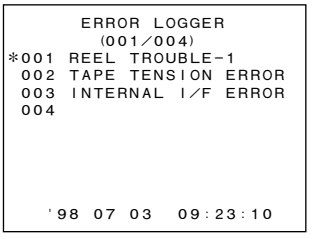
The display returns to the error logger display mode when the MENU button is pressed with the white square displayed in the upper-right position of the superimposed display.
Pressing the MENU button in the error logger display mode terminates the error logger display mode.

Limited-display screen

For the error log of a category that is set to OFF in the menu of setting mode (refer to Section 4-3-3), information items other than a log number are not displayed. However, the whole display using the F FWD button is not influenced by the setting.

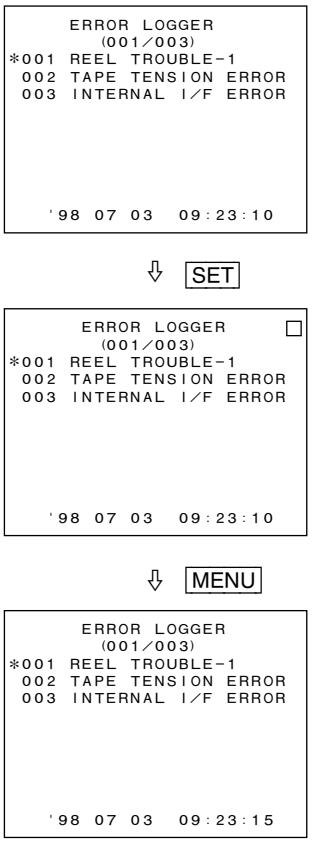


Ordinary Screen (No limited-display)



Only Warning Turned Off

Example of display and operation



4-3-3. Setting Mode

The setting mode is used to display a menu that limits the display of an error log. In this menu, the display can be turned on and off for each error log category. A calendar/clock can also be set in this menu.

Notes

- The top and second screens on the right are the examples displayed when the error logger mode and setting mode are first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- A white square mark is displayed in the upper-right position of the superimposed display as in the display mode when the SET button is pressed in the setting mode (except when "Push SET Button" is displayed during calendar/clock setting). The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed). The former state is returned when the MENU button is pressed.

Entering the setting mode

Press the SET button while pressing the STOP button in the display mode.

Returning to the display mode

Press the SET button again while pressing the STOP button or press the MENU button.

Setting menu

The seventh to tenth lines on the superimposed display are a setting menu. The display in the display mode is left in the first to fifth lines.
Each setting when the power is turned on is all ON.
The error log belonging to a category is limited in display when each item is set to OFF. (Refer to the "Limited-display screen" on the previous page.)
The changed setting is valid until the power is turned off.
How to change the setting is described below.

(1) Turn the search dial to set the ∗ mark to the category to be changed in setting.

Notes

- In the time data display area, the contents of the ∗-marked line are displayed on the superimposed display.
- Turn the search dial continuously in FORWARD (↻) direction for the calendar/clock setting. (Refer to the next page.)

(2) To change the setting, turn the search dial while pressing the JOG button.
ON ⇨ OFF: REVERSE (↺) direction
OFF ⇨ ON: FORWARD (↻) direction

(3) To change the setting of other categories, repeat steps (1) and (2).

(4) To finish the setting mode, press the MENU button once.

Example of display and operation

Display mode

```
      ERROR LOGGER
        (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR




   '98 07 03  09:23:15
```

⇩ [STOP] + [SET]

Setting mode

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
*TAPE ERROR          ON
 WARNING             ON
 CONDITION           ON


   '98 07 03  09:23:17
```

⇩ DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '98 07 03  09:23:20
```

⇩ [JOG] + DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING            OFF
 CONDITION           ON


   '98 07 03  09:23:22
```

⇩ [JOG] + DIAL(↻)

```
      ERROR LOGGER
        (001/003)
 001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR          ON
*WARNING             ON
 CONDITION           ON


   '98 07 03  09:23:24
```

Calendar/clock setting

The calendar/clock's date and time of this unit can be adjusted in the setting mode as described below.
In a display/operation example on the right, 9:23 of July 3rd in 1998 is set to 15:00 of August 1st in 1998.

(1) Turn the search dial slowly and turn on and off the numerical value (year, month, day, hour, minute, or second) of the calendar/clock item to be changed.

Notes

- When the ∗ mark is displayed in the setting menu, turn the search dial continuously in FORWARD (↻) direction until the numerical value blinks. For the calendar/clock setting, the ∗ mark is not displayed on the superimposed display.
- Do not turn the search dial excessively in REVERSE (↺) direction during setting. The ∗ mark is displayed in the setting menu and the calendar/clock setting is stopped.

(2) Turn the search dial while pressing the JOG button and change the numerical value to the desired one.

Notes

- The count display of seconds stops when the numerical value is changed. The internal data is updated.
- On the superimposed display, a message "Push SET Button" is displayed in the upper line.

(3) Repeat steps (1) and (2) until the numerical values in other items are changed completely.

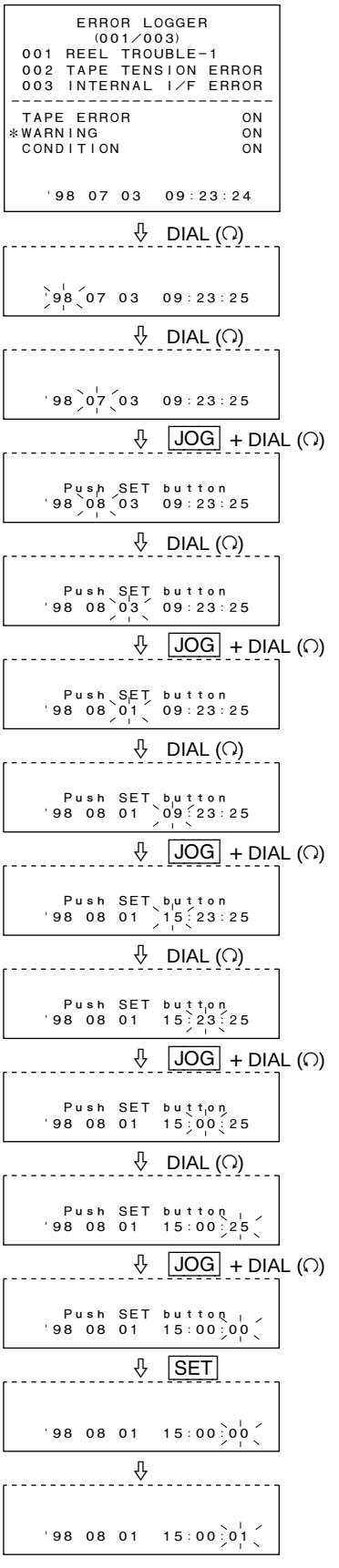
(4) Press the SET button to save the setting values.

Notes

- To change only the date, the time must also be set again.
- To cancel the calendar/clock setting, terminate the setting mode or turn the search dial in REVERSE (↺) direction until the ∗ mark is displayed in the setting menu (the setting menu item is displayed for the time data display area).
- The unit enters the normal operation state when the SET button is pushed with the message "Push SET Button" not displayed on the superimposed display. Press the MENU button to return to the former state.
- To set the time accurately, press the SET button immediately the display and current time coincided.

(5) To exit the setting mode, press the MENU button once.

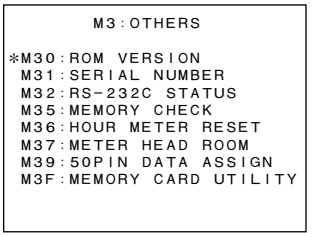
Example of display and operation



4-4. OTHERS CHECK Mode (M3)

4-4-1. Outline

The OTHERS check mode is used for other checks. This unit has the six menus and two submodes (M39 and M3F) below.



OTHERS CHECK mode

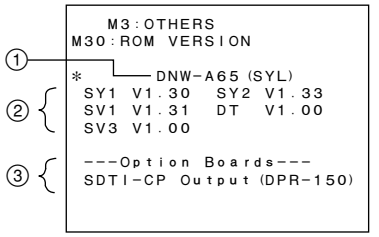
Title	Page	Description
M30 : ROM VERSION	4-76	Displays the unit's model name, ROM version, and optionally mounted board.
M31 : SERIAL NUMBER	4-76	Displays and corrects the serial number of this unit.
M32 : RS-232C STATUS	4-77	Displays the interface communication state of an RS-232C connector.
M35 : MEMORY CHECK	4-78	Displays the data in ROM. (Used for check at the factory.)
M36 : HOUR METER RESET	4-78	Displays and resets the resettable hours meter and thread counter.
M37 : METER HEAD ROOM	4-79	Sets the head room of an audio level meter.
M39 : 50PIN DATA ASSIGN	4-79	Sets the 50-pin parallel remote.
M3F : MEMORY CARD UTILITY	—	Uploads and downloads the software using the memory card box.

M3F : MEMORY CARD UTILITY

M3F:MEMORY CARD UTILITY is the mode which is required to connect the specified tool; memory card BOX (CDS-20 assembly) when using this mode.
The menu explanation, connection of tool and how to upload/download of software are described in the maintenance manual part 2, volume-1.

4-4-2. ROM VERSION Display Menu (M30)

This menu displays the model name of this unit, the destination, the ROM version, and the information of the installed option.



Description of superimpose picture

① The model name of this unit and the destination in parentheses are displayed on the superimposed display. The model name and destination are detected from the setting condition of the DIP switch (S1102) on the SS-83 board.

② Each version number of system control ROMs (SY1 and SY2), a servo ROM (SV1), and a DT board control ROM (DT) is displayed on the superimposed display.
When BKNW-124 is used, a version number of BKNW-124 control ROM (SY3) is also displayed.

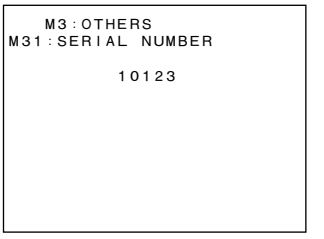
③ The installed option is displayed as described below when the option is installed.
BKNW-118 ⇨ SDTI (SX) Output (DPR-119)
BKNW-124 ⇨ SDTI-CP Output (DPR-150)

Menu operation

Turn the search dial to move the ∗ mark.
The contents of the ∗-marked item on the superimposed display are also displayed in the time data display area.
The installed option is displayed on only the superimposed display.

4-4-3. SERIAL NUMBER Display Menu (M31)

This menu displays the serial number of this unit. When each serial number does not coincide because of repair, it can be set again in this menu.



Notes

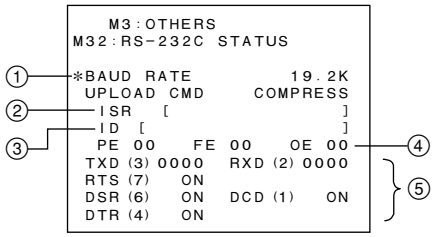
- Set the serial number again after the MS-58 board or the NV-RAM (IC9 on the MS-58 board) is replaced.
- "−−−−−" is displayed in the state where no serial number is set.

Serial number setting

(1) Turn the search dial to turn on and off the digit you wish to set.
(2) Turn the search dial while pressing the JOG button and change the digit number.
  - On changing the serial number, a message "Push SET Button" will be displayed on only the superimposed display.
  - To cancel the setting, press the MENU button to terminate this menu.
(3) Repeat steps (1) and (2) for each digit.
(4) Press the SET button to save the set serial number.
  - On pressing, a message "Saving..." will be displayed on only the superimposed display. If no abnormality is found, the display changes to "Save Complete" after a few seconds.

4-4-4. RS-232C STATUS Display Menu (M32)

This menu displays the communication state of an RS-232C interface. The communication baud rate can also be changed in this menu.



Note

Only the information of the communication baud rate is displayed in the time data display area.

Description of superimpose picture

① The communication baud rate is displayed on the superimpose picture. The baud rate can be selected from among the followings. (The factory setting is 19.2 K.)
1200, 2400, 4800, 9600, 19.2K (bps)

Note

In a time data display area, 19.2K is displayed as "19 2K".

② The status of an ISR protocol is displayed on the superimpose picture.

ISR x [yyyy . . . . .]
ⓐ ⓑ

ⓐ Displays the protocol status of this unit.
A: ACK send
N: NAK send
T: ATN (OPC or QRESP) send
W: ACK wait
X: XOFF receive, XON wait

ⓑ Displays the last ISR command that was received properly. (The preceding command is displayed until ACK transmission is completed.)

If no object for communication is connected to the RS-232C connector, items ⓐ and ⓑ become blank.

③ The device ID is displayed on the superimpose picture. The device ID is set using the DEVICE command of an ISR protocol. This setting is maintained (even if the power is turned off) until it is changed by the DEVICE command. The device ID becomes blank when it is not set.

④ The number of errors below that occur during reception is displayed on the superimposed display.
PE: Parity error
FE: Framing error
OE: Overrun error
If no object for communication is connected to the RS-232C connector, each error is not displayed as a time count, but as "00".

⑤ The numeral number in parentheses is the pin number of the RS-232C connector.
TXD/RXD displays the number of data (number of bytes) properly sent/received in this unit in four digits (hexadecimal). Others display the connection state of the RS-232C connector in "ON" (+3 V or more) and "OFF" (−3 V or less). When the object for communication is connected to the RS-232C connector, they display as "ON". If no object for communication is connected to the RS-232C connector, the TXD and RXD are displayed as "0000" and the DSR and DCD become undefined state.

Setting of communication baud rate

(1) Turn the search dial while pressing the JOG button and display the desired baud rate.
- On changing the setting, a message "Push SET Button" will be displayed on only the superimposed display.
- To cancel the setting, press the MENU button to terminate this menu.

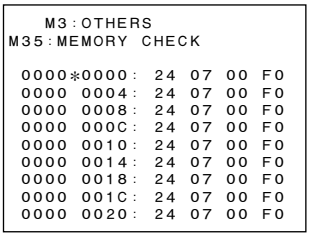
(2) Press the SET button to save the setting.
- On pressing, a message "Saving ..." will be displayed on only the superimposed display. If no abnormality is found, the display changes to "Save Complete" after a few seconds.
To turn off "Save Complete", turn the search dial.

Note

A white square is displayed in the upper-right position of the superimposed display when the SET button is pressed except during communication baud rate setting. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

4-4-5. MEMORY CHECK Display Menu (M35)

This menu displays the ROM data installed in this unit in hexadecimal.



Note

This menu is used for inspection at the factory.

Menu operation

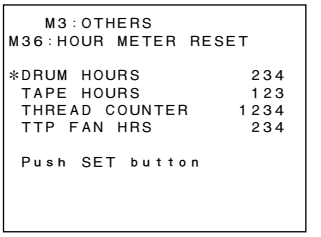
Turn the search dial to move the * mark upward or downward. The address and data display portions are then scrolled.
Turn the search dial while pressing the JOG button: The address then changes 100H at a time.
Turn the search dial while pressing the VAR button: The address then changes 10000H at a time.
Turn the search dial while pressing the JOG and VAR buttons: The address then changes 1000000H at a time.
The contents of the *-marked line on the superimposed display are also displayed in the time data display area.

Note

A white square is displayed in the upper-right position of the superimposed display when the SET button is pressed. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

4-4-6. HOUR METER RESET Menu (M36)

This menu can display and reset the values of the resettable hours meter and thread counter.



Description of superimpose picture

DRUM HOURS: Indicates the total of drum rotation time. Same as in setup menu ITEM-H12.
TAPE HOURS: Indicates the total of tape transport time. Same as in setup menu ITEM-H13.
THREAD COUNTERS: Indicates the total of threading count. Same as in setup menu ITEM-H14.
TTP FAN HRS: Indicates the total of fan (MD) time used. Same as in setup menu ITEM-H15.

Menu operation

Turn the search dial to move the * mark.
The contents of the *-marked line on the superimposed display are also displayed in the time data display area.

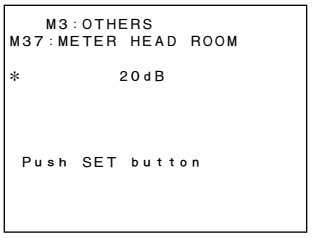
To reset

The former state cannot be returned when the SET button is pressed for reset operation.

(1) Turn the search dial and move the * mark to the item to be reset.
(2) Turn the search dial in REVERSE (↺) direction while pressing the JOG button. = The display value then becomes zero ("0").
  - On setting the display value to "0", a message "Push SET Button" will be displayed on only the superimposed display.
  - To return to the former state, turn the search dial in FORWARD (↻) direction.
(3) If there are other items to be reset, repeat steps (1) and (2).
(4) Press the SET button to save the reset data.
  - On pressing, a message "Saving..." will be displayed on only the superimposed display. If no abnormality is found, the display changes to "Save Complete" after a few seconds.
    To turn off "Save Complete", turn the search dial.

4-4-7. METER HEAD ROOM Setup Menu (M37)

This menu can change the head room setting of an audio level meter.
The head room can be selected from among the followings. (The factory setting is 20 dB.)
20 dB, 18 dB, 16 dB, 15 dB, 14 dB, 12 dB, 9 dB



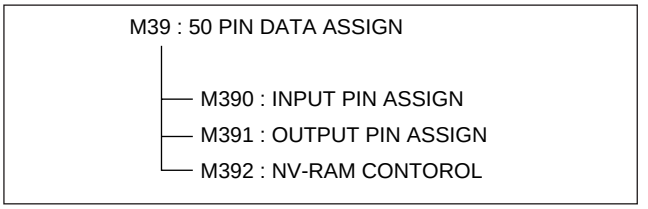
Head room setting

(1) Turn the search dial while pressing the JOG button, and the desired setting is then displayed.
- On changing the setting, a message “Push SET Button” will be displayed on only the superimposed display.
- To cancel the setting, press the MENU button to terminate this menu.

(2) Press the SET button to save the changed setting.
- On pressing, a message “Saving...” will be displayed on only the superimposed display. If no abnormality is found, the display changes to “Save Complete” after a few seconds.
  To turn off “Save Complete”, turn the search dial.

4-4-8. 50PIN DATA ASSIGN Mode (M39)

The M39 : 50PIN DATA ASSIGN changes and resets the pin setup data of 50-pin parallel remote which are settable. Also displays the logic level of the input pin.
Three menus are available.



Menu Tree of 50PIN DATA ASSIGN

CAUTION

Do not change the setting data carelessly. This may cause a trouble. For the actual setting, refer to the optional parallel remote (50-pin) connector interface manual.
If you have changed the setting data carelessly, execute ALL DATA PREVIOUS in M392 : NV-RAM CONTROL menu or turn off the power of this unit without selecting M392 : NV-RAM CONTROL. Never execute SAVE ALL DATA.

M390 : INPUT PIN ASSIGN

This menu changes and resets the input pin setup data. Also displays the logic level of the input pin.

Description of display

The pin numbers are displayed at the line of “No.”. Also the right at the pin number is displayed the logic level state (H;high, L;low).

To change the setup data

(1) Turn the search dial (JOG mode) to set the ∗ mark to the left side of the data to be changed.

(2) Turn the search dial while pressing the JOG button to change the data.
FORWARD direction (↻): Data value increase
REVERSE direction (↺): Data value decrease

Note

At the first bite, the data change only area of which from 00 to 73. If it is required to extend the area of which from 00 to FF, turn the search dial while pressing the EJECT and PLAY buttons simultaneously.

(3) Repeat steps (1) and (2) for any other data.
(4) To finish the menu, press the MENU button once.
(5) To save the setup data into the NV-RAM, execute the SAVE ALL DATA in M392 : NV-RAM CONTROL menu.

Example of display and operation

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.       Command
---+--------------------
 01:H*20 10 00 00 00 00
 18:H 20 30 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(1) ⇩ DIAL

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.       Command
---+--------------------
 01:H 20 10 00 00 00 00
 18:H 20*30 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(2) ⇩ JOG+DIAL

```
   50PIN DATA ASSIGN
M390:INPUT PIN ASSIGN

 No.       Command
---+--------------------
 01:H 20 10 00 00 00 00
 18:H 20*50 00 00 00 00
 19:H 20 05 00 00 00 00
 20:H 20 20 00 00 00 00
 21:H 40 10 00 00 00 00
 22:H 20 04 00 00 00 00
 23:H 20 0F 00 00 00 00
```

(4) ⇩ MENU
(5) ⇩ Data save

```
*M392:NV-RAM CONTROL
```

http://getMANUAL.com

M391 : OUTPUT PIN ASSIGN

This menu changes and resets the output pin setup data. Also displays the logic level of the input pin.

Description of display

The pin numbers are displayed at the line of “No.”. Also the right at the pin number is displayed the logic level state (H;high, L;low).

To change the setup data

(1) Turn the search dial (JOG mode) to set the ∗ mark to the left side of the data to be changed.
(2) Turn the search dial while pressing the JOG button to change the data.
FORWARD direction (↻): Data value increase
REVERSE direction (↺): Data value decrease

Note

At the first bite, the data change only area of which from 00 to 73. If it is required to extend the area of which from 00 to FF, turn the search dial while pressing the EJECT and PLAY buttons simultaneously.

(3) Repeat steps (1) and (2) for any other data.
(4) To finish the menu, press the MENU button once.
(5) To save the setup data in the NV-RAM, execute the SAVE ALL DATA in M392 : NV-RAM CONTROL menu.

Example of display and operation

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H*02 02 72 20 00 00
 11:H 02 02 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(1) ⇩ DIAL

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H 02 02 72 20 00 00
 11:H 02*02 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(2) ⇩ JOG +DIAL (↻)

```
   50PIN DATA ASSIGN
M391:OUTPUT PIN ASSIGN

 No.       Command
---+--------------------
 10:H 02 02 72 20 00 00
 11:H 02*01 72 10 00 00
 12:H 01 02 00 20 00 00
 13:H 02 02 2B 08 00 00
 26:H 02 02 72 08 00 00
 27:H 02 02 04 10 00 00
 28:H 02 02 01 10 00 00
```

(4) ⇩ MENU
(5) ⇩ Data save

```
*M392:NV-RAM CONTROL
```

M392 : NV-RAM CONTROL

This menu is used to save the input/output data set in the 50 PIN DATA ASSIGN mode into the NV-RAM.
The current setup data can return to the former saved data before the change when executing ALL DATA PREVIOUS without saving the setup data into the NV-RAM.

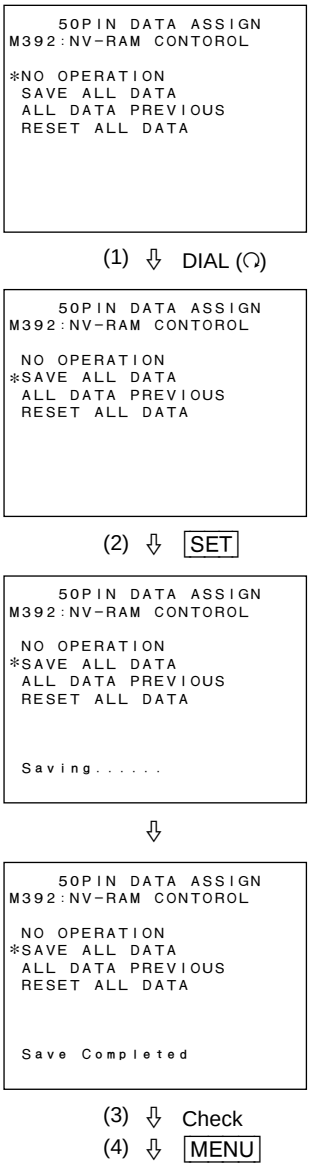
Note

When the power is turned off without saving the changed data, the setup data returns to the former saved data.

To execute the menu

(1) Turn the search dial to set the ∗ mark on the superimposed display as described below.
   To save the setup data after changing:
   ⇨ "SAVE ALL DATA"
   To return the setup data before changing:
   ⇨ "ALL DATA PREVIOUS"
   To return the setup data to factory setting, and save that data:
   ⇨ "RESET ALL DATA"
(2) Press the SET button.
   • On pressing it, the data transmission is initiated.
   • On the superimposed display, a message "Saving ..." or "Loading ..." will be displayed.
   In the time data display area, a message "SAVING" or "LOADING" will be displayed.
(3) Check to see that the data transmission is completed.
   • On completing the data transmission:
   On the superimposed display, a message "Save Complete." or "Load Complete" will be displayed.
   In the time data display area, a message "SAVING" or "LOADING" will be displayed.
(4) To exit the menu, press the MENU button once.

Example of display and operation



Section 5
Periodic Maintenance and Inspection

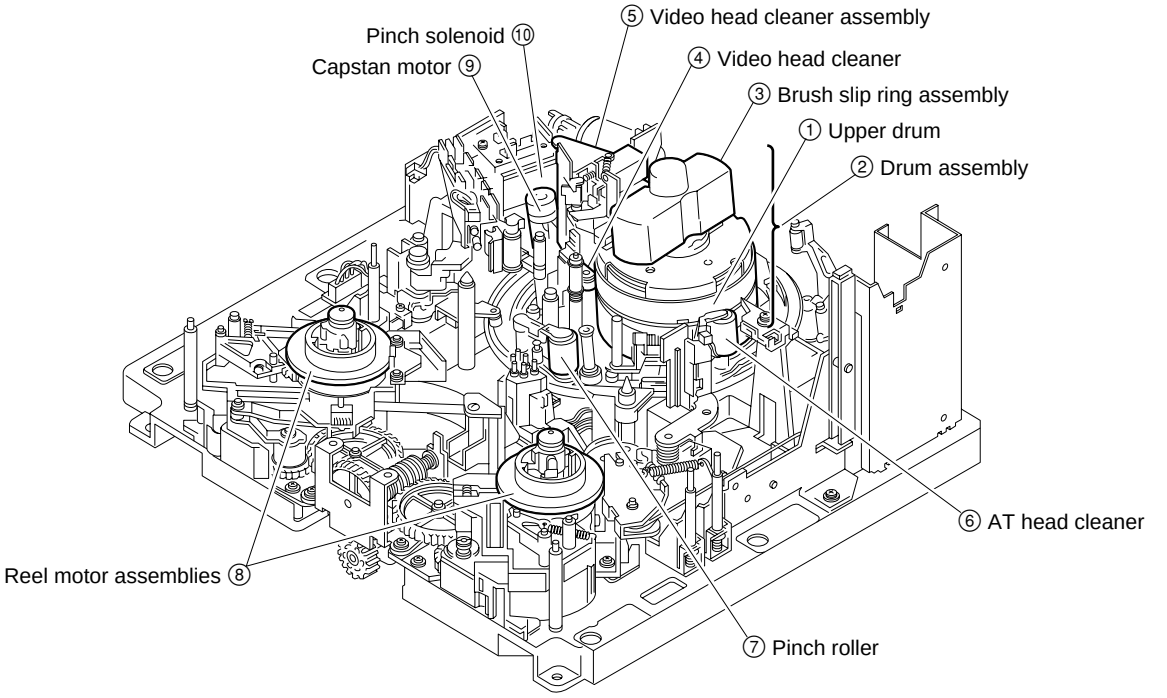
This section explains about periodic maintenance and how to clean.

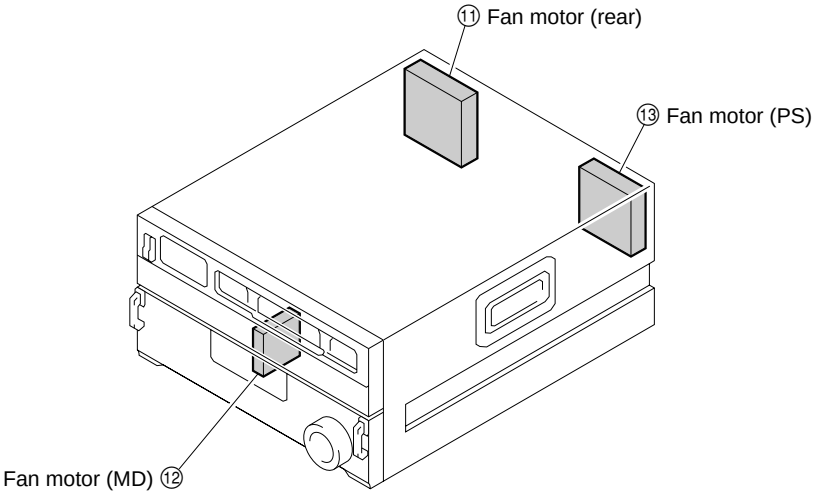
5-1. Periodic Maintenance

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit, periodic check and parts replacement are recommended.

5-1-1. Index

It is necessary to check and replace periodically to the following parts.
The numbers in the illustration correspond to the table in the next page.





5-1-2. Periodic Replacement and Check Item Table

The replacement time shown in the following table is not the guarantee term of parts. The replacement time of parts varies depending on the operating environment and conditions of the unit.
Especially the pinch roller and cleaners, may be required replacing earlier than replacement period shown in the table depending on the degree of their dirt or abrasion.
The arrows "↓" and "↑" in the table indicate that the part is included in the assembly described on the lower/upper line. If the assembly on the pointed line is replaced, the part is also replaced as a component of the assembly together.
As for the hours meter, refer to Section 5-1-3.
As for replacing each part, refer to the maintenance manual Part 2, Volume-1.

R : Replace the part. C : Perform check (adjustment).
Replace it depending on its condition.

No.	Replacement parts	Hours meter (Menu No.)	Inspection hours (h) 1000	2000	3000	4000	5000	6000	
①	Upper drum	Drum rotating time (H02)		C *1	C *1	C *1	C *1	C *1 (↓)	
②	Drum assembly *2	Drum rotating time (H02)						C *3	
③	Brush slip ring assembly	Drum rotating time (H02)						R (↑)	
④	Video head cleaner	Drum rotating time (H02)	C *4	C *4	C *4	C *4	C *4	↓	
⑤	Video head cleaner assembly *5 *6	Drum rotating time (H02)						R	
		Threading times (H04)	Replace when used 200,000 times						
⑥	AT head cleaner	Drum rotating time (H02)	C *4	R	C *4	R	C *4	R	
⑦	Pinch roller	Tape running time (H03)	C *4	R	C *4	R	C *4	R	
⑧	Reel motor	Tape running time (H03)				R			
⑨	Capstan motor	Tape running time (H03)						R	
⑩	Pinch solenoid *6	Tape running time (H03)						R	
		Threading times (H04)	Replace when used 200,000 times						
⑪	Fan motor (rear)	Energized time (H01)	Replace when used 40,000 hours						
⑫	Fan motor (MD)	Energized time (H15)	Replace when used 40,000 hours						
⑬	Fan motor (PS)	Energized time (H01)	Replace when used 40,000 hours						

∗1 : Refer to Section 5-3 to measure and check the video head tip protrusion.
∗2 : Drum assembly includes an upper drum and a brush slip ring assembly.
∗3 : Check (adjust) the video tracking referring to Section 4-1-3 of the maintenance manual part2, volume-1.
∗4 : Check that the shape is not deformed and that is not dirty by visual.
∗5 : Video head cleaner assembly includes a video head cleaer.
∗6 : Replace these parts when the replacement period or count is reached whichever is earlier.

Part No.	Name	Q'ty	Note
A-8320-334-A	Upper drum DJR-23A-R	1	
A-8320-332-A	Drum DJH-23A-R	1	
A-8320-032-A	Ring (9) assembly (RP), brush slip	1	
A-8320-546-A	Roller (B) assembly (RP), V cleaning	1	
3-182-765-02	Spacer, CR	1	
A-8320-545-A	Video head cleaner (B) assembly (RP)	1	
X-3167-053-2	Arm assembly, CL	1	
X-3167-054-4	Arm assembly, pinch	1	
A-8267-774-E	RM assembly	2	
1-698-179-12	Motor, DC (capstan)	1	
1-454-338-00	Solenoid, plunger	1	
1-763-170-11	Fan, DC (92 square)	1	
1-698-786-11	Fan, DC (60 square)	1	
1-698-785-41	Fan, DC (80 square)	1	

Replace the parts shown in the table below periodically when the threading/un-threading operation is repeated frequently.

Replacement parts	Replacement period	Part No.	Name	Q'ty
Brake solenoid	Every 200,000 times of threading	1-454-417-31	Solenoid, Plunger	1
S tension regulator	Every 200,000 times of threading	A-8267-795-E	Tension regulator assembly (RP)	1
T tension regulator	Every 200,000 times of threading	A-8267-423-B	T-tension regulator assembly	1
T drawing arm assembly	Every 200,000 times of threading	A-8278-313-A	Drawer assembly (T)	1
Gear box assembly	Every 200,000 times of threading	A-8267-424-A	Box assembly, Gear	1
Threading ring assembly	Every 200,000 times of threading	A-8267-395-F	Ring assembly, Threading	1
Ring roller	Every 200,000 times of threading	3-180-677-01	Roller, Ring	2
		3-180-679-01	Roller (B), Ring	1
Pinch arm guard	Every 200,000 times of threading	3-180-853-01	Guard, Pinch arm	1
CL guide rail	Every 200,000 times of threading	3-180-874-02	Rail, CL guide	1
Cassette compartment assembly	Every 200,000 times of threading	A-8267-589-F	Cassette compartment (RP)	1
Video head cleaner	Every 1,000 hours of drum rotating	A-8320-546-A	Roller (B) assembly (RP), V cleaning	1
		3-182-765-02	Spacer, CR	1
AT head cleaner	Every 1,000 hours of drum rotating	X-3167-053-2	Arm assembly, CL	1
Pinch roller	Every 1,000 hours of drum rotating	X-3167-054-4	Arm assembly, Pinch	1

5-1-3. Hours Meter

This unit can display an hours meter on the time data display area of the lower control panel. Perform a periodic check with this hours meter as a reference.

1. Contents of display

Menu No.	Display	Contents
H01	OPERATION HOURS	Sum of energized time
H02	DRUM RUNNING HOURS	Sum of drum rotating time
H03	TAPE RUNNING HOURS	Sum of tape running time
H04	THREADING COUNTER	Sum of threading
H12	DRUM RUNNING HOURS	Sum of drum rotating time (Resettable)
H13	TAPE RUNNING HOURS	Sum of tape running time (Resettable)
H14	THREADING COUNTER	Sum of threading (Resettable)
H15	TTP FAN OPERATION HOURS	Sum of TTP fan operating time (Resettable)

2. Display procedure

1. Press the MENU button on the lower control panel.
2. Put the "*" to the desired ITEM by turning the search dial.
3. Press the SET button on the lower control panel to display the hours meter.
4. Press the MENU button once and repeat from step 2 to display other ITEM.
   Press the MENU button twice to exit the MENU.

5-2. Cleaning

To make the most of the functions, fully realize the performance of this unit, and to lengthen the life of the unit and tape, clean the components often.

5-2-1. Cleaning using Cleaning Tape

If the video heads are clogged, clean the video head as the following procedure. Make sure to use the specified cleaning tape. If other tape is used, unusual abrasion or damage of the video heads may occur.

Specified cleaning tape: BCT-5CLN

Procedure

1. Insert the cleaning tape BCT-5CLN into the unit.
2. Press the EJECT and PLAY buttons simultaneously.
   The cleaning tape is played back for approx. 5 seconds. After that, the cleaning tape will be ejected automatically.
   Notes
   - If the cleaning tape is not ejected after playing back more than 5 seconds, press the EJECT button immediately to eject the cleaning tape.
   - Do not fast-forward or rewind the cleaning tape and leave it into the unit in the STOP mode to avoid damage to the video head.
3. Check to see that the head clogging is clear.

If the video heads are still clogged after cleaning using a cleaning tape, clean them using a cleaning cloth. (Refer to Section 5-2-3.)

5-2-2. General Information for Cleaning using Cleaning Cloth

1. Cautions

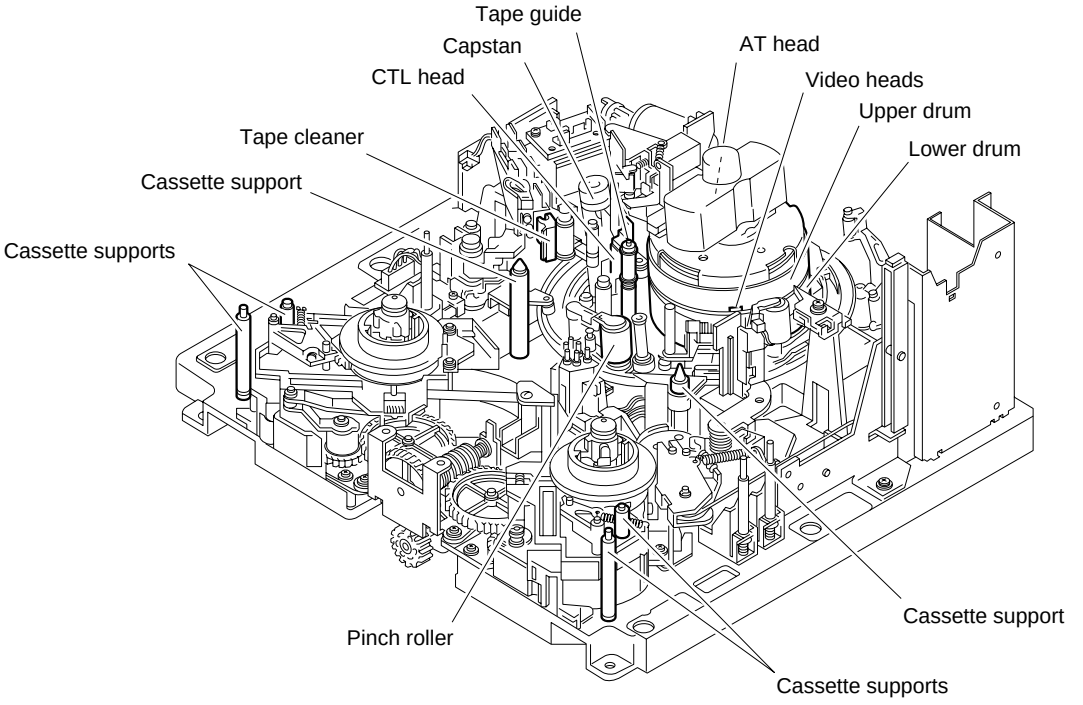
- Be sure to turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not contact the greased portions during cleaning. If the grease smears to a cleaning cloth, use a new cloth to avoid allow the grease to contact places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

2. Preparation

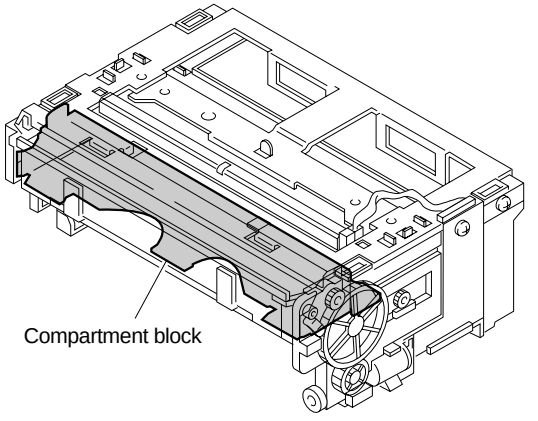
1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1.)
3. Remove the plate MD assembly. (Refer to Section 2-4.)
4. Remove the cassette compartment. (Refer to Section 2-5.)

3. Cleaning Parts

< Mechanical Deck Block >



< Cassette Compartment >



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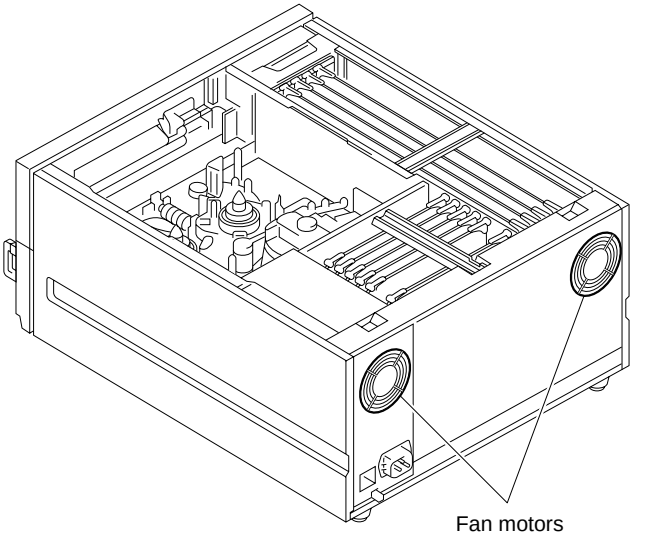


5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning

WARNING

Never contact the rotating drum.
Be sure to turn off the power and wait until the drum comes to a complete stop befer cleaning.

Caution

The video heads are the part that can be damaged easily. Be careful not to damage the video heads during cleaning.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Note

Never use a cotton swab to clean the video heads.

Procedure

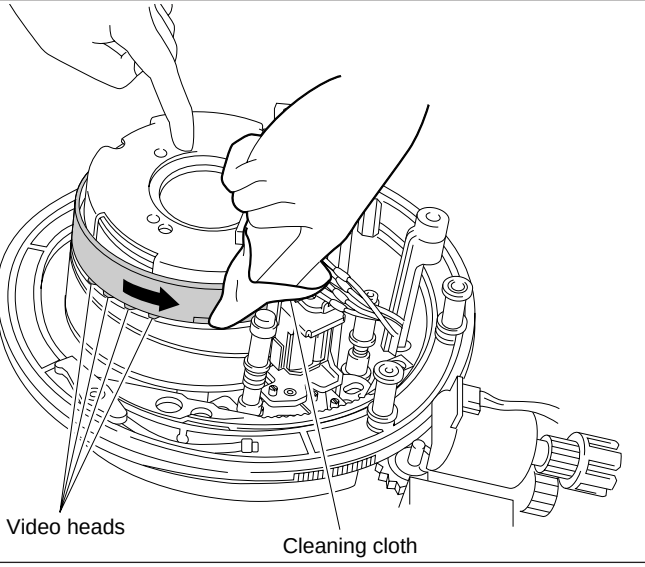
1. Hold the cleaning cloth moistened with a cleaning fluid keeping it without becoming wrinkled. And then slightly press the cleaning cloth against the video heads.

2. Slowly rotate the upper drum counterclockwise two or three turns and clean the tape-running surface and video heads without moving the cleaning cloth.

   Note

   Be sure to rotate the upper drum counterclockwise and clean the video heads along the circumference. Do not rotate it in the opposite direction (clockwise) or clean the video heads in the vertical direction to avoid damaging the video heads and brush slip ring assembly.

3. After cleaning, wipe them using a dry cleaning cloth two or three times.



Video Heads Cleaning

5-2-4. Tape Running Surface of Lower Drum and Lead Surface Cleaning

Caution

Be careful not to damage the lower drum (especially lead surface) during cleaning. Pay careful attention when cleaning the edge portion above the lower drum because it is located near the video heads.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Skewer or an equivalent (Not metallic.)

Procedure

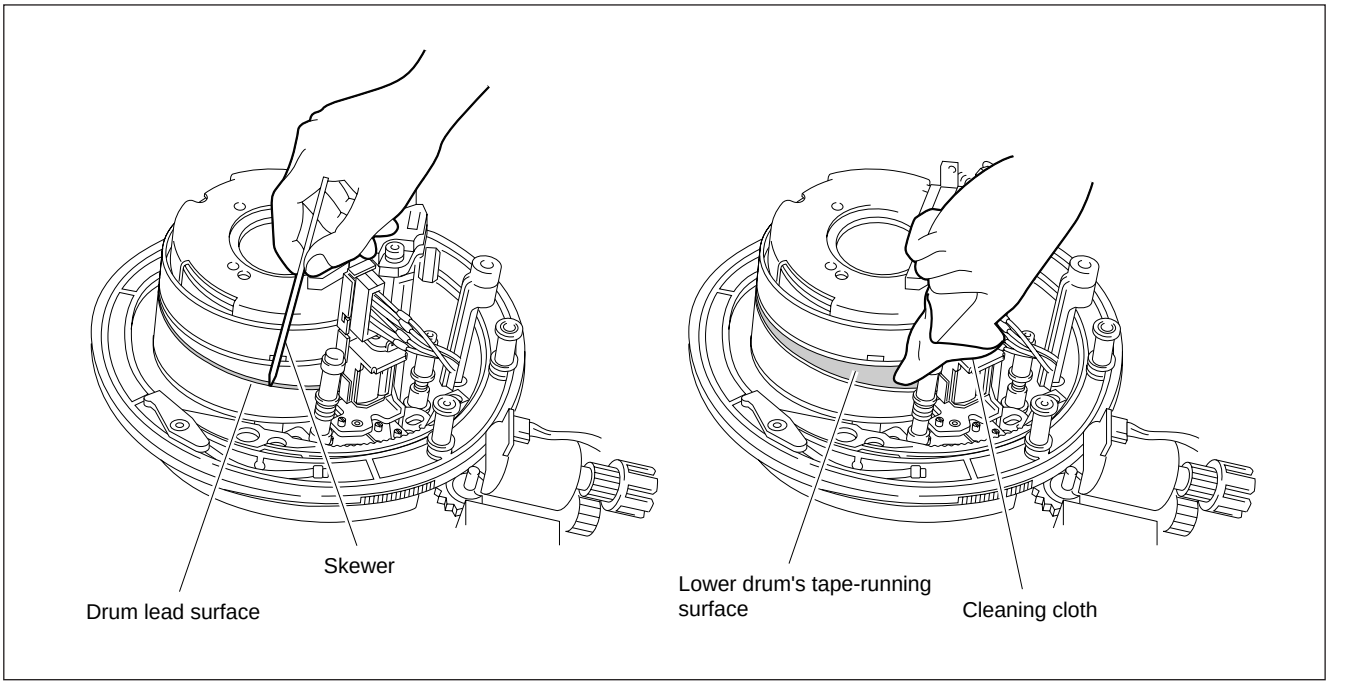
1. As shown in the figure, remove the maghetic powder using a skewer, running the skewer on the drum lead surface.

   Notes

   - Never use a metallic skewer to aviod damaging the tape-running surface.
   - Be sure to remove the magnetic powder completely. Tracking may be badly influenced if magnetic powder attaches to the drum lead surface.

2. Clean the drum lead surface and lower drum's tape-running surface (shaded portion in the figure) using a cleaning cloth moistened with a cleaning fluid.

3. After cleaning, wipe them using a dry cleaning cloth two or three times.



Tape-Running Surface of Lower Drum and Lead Surface Cleaning

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5-2-5. Stationary Heads Cleaning

Caution

• Be careful not to damage the head surface when cleaning the stationary heads.

Tools

• Cleaning cloth: 3-184-527-01
• Cleaning fluid: 9-919-573-01

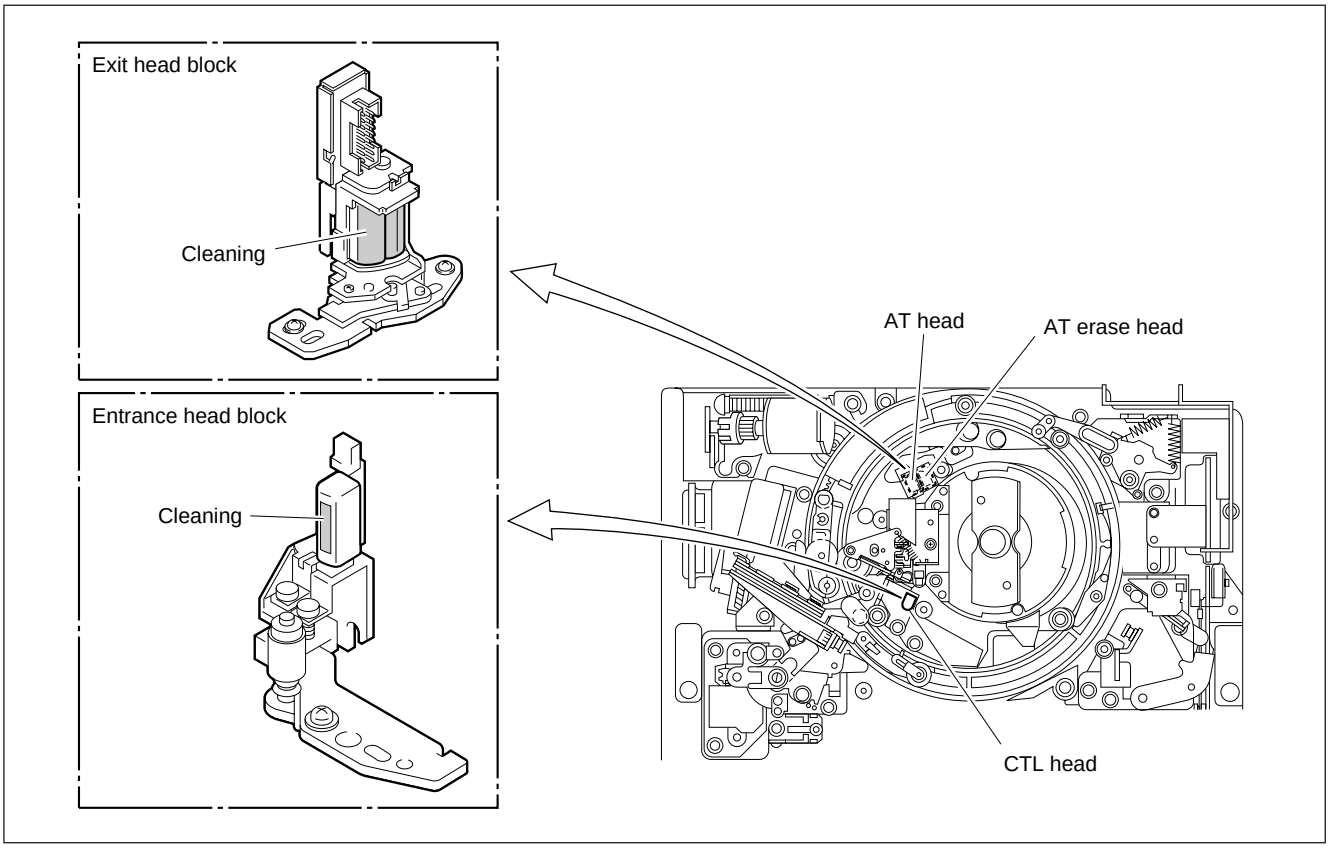
Procedure

1. Clean the tape-running surfaces of the AT, AT erase, and CTL heads in the vertical direction using a cleaning cloth moistened with a cleaning fluid.

   Note

   Be sure to remove the magnetic powder completely.
   An error may occur in the playback if magnetic powder attaches to the head gap portion of the AT, AT erase, and CTL heads.

2. After cleaning, wipe them using a dry cleaning cloth two or three times.



Stationary Heads Cleaning

5-2-6. Tape Running System and Tape Cleaner Cleaning

WARNING

Keep bare hands away from the sharp edge of the tape cleaner to avoid cuts and injuries.
Pay careful attention when cleaning the tape cleaner.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Procedure

1. Wipe off the surfaces of the tape cleaner using a paper (such as a sheet of paper of this manual) to remove the magnetic powder adhered on the tape cleaner.

   WARNING

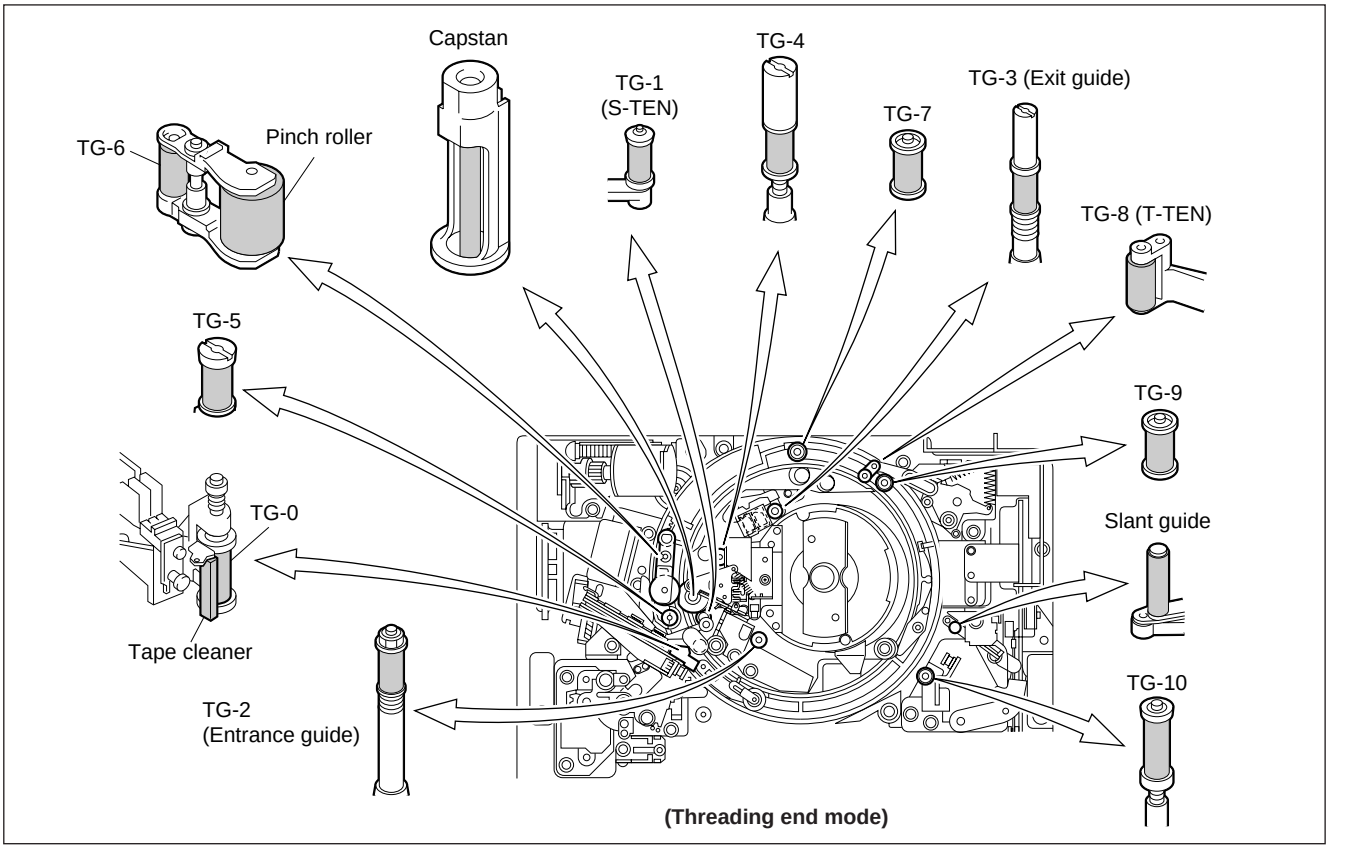
   Do not contact the edge portion of the tape cleaner with bare hands.

   Note

   Do not apply an excessive force to the tape cleaner to avoid damaging it.

2. Clean the tape-running surfaces (shaded portions in the figure) of each guide and the tape cleaner using cleaning cloth moistened with a cleaning fluid.

3. After cleaning, clean them using a dry cleaning cloth two or three times.



Tape Running System and Tape Cleaner Cleaning

5-2-7. Fan Motors Cleaning

Notice

Clean the fan motor on the rear panel often because it accumulates dust easily.
The dusty fan motors disturb the air flow through the unit, and a rise in the inside temperature of the unit may badly influence the performance and life of the unit.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Vacuum cleaner

Procedure

1. Remove the power panel. (Refer to Section 2-3-4.)
   Disconnection of harnesses is not required.

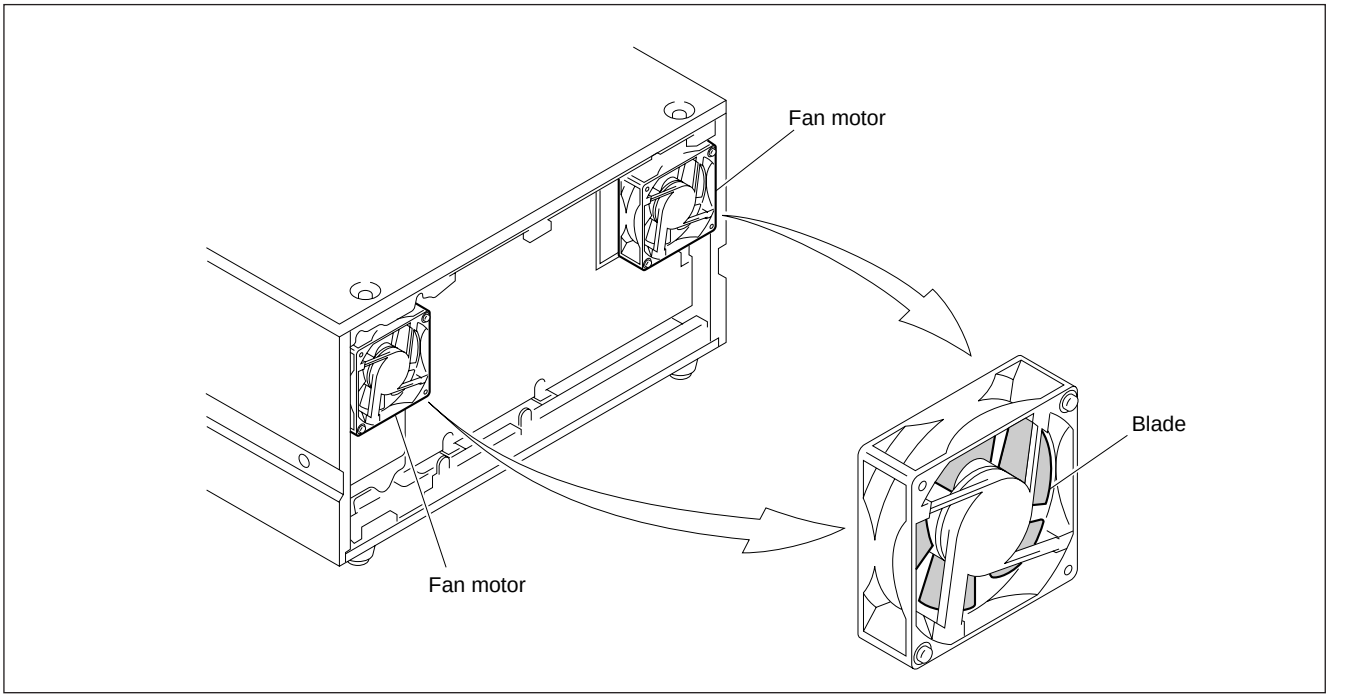
2. Remove the connector panel. (Refer to Section 2-3-3.)
   Disconnection of harnesses is not required.

3. Remove the dust on the fan motors using a vacuum cleaner.

4. Clean the blades of the fan motors (shaded portion in the figure) using cleaning cloth moistened with a cleaning fluid.

5. Reattach the connector panel. (Refer to Section 2-3-3.)

6. Reattach the power panel. (Refer to Section 2-3-4.)



Fan Motors Cleaning

5-2-8. Cassette Compartment and Cassette Supports Cleaning

Notes

- Being careful not to apply an excessive force to the compartment block or mirror, clean the cassette compartment.
- Do not use an alcoholic chemical in cleaning of the door and mirror to avoid cracking them.

Tools

- Cloth (or Gauze)
- Vacuum cleaner

Procedure

1. Remove the cassette compartment from the unit. (Refer to Section 2-5.)

2. Remove the dust on the cassette compartment from the cassette insertion inlet using a vacuum cleaner.

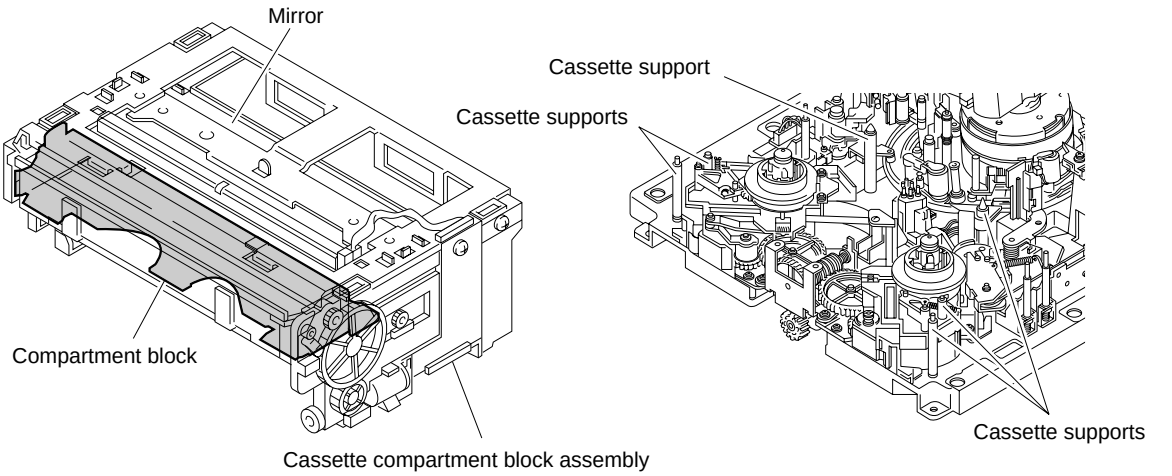
3. Clean the compartment (shaded portion in the figure) using a dry cloth (or gauze).

   Note

   Do not apply an excessive force to the compartment block.

4. Clean the cassette supports on the mechanical deck using a dry cloth (or gauze).

5. Reattach the cassette compartment. (Refer to Section 2-5.)



Cassette Compartment Cleaning

5-3. Video Head Tip Protrusion Check

When performing the periodic maintenance or inspection, measure the tip protrusion of the video heads using a head tip protrusion measurement gauge to check them for the upper drum assembly replacement.

If the tip protrusion of all heads are satisfying the following specification and more, it enables to playing back on the tape.

Head	Specification
PB heads for Betacam/Betacam SP format	20 µm
PB heads for Betacam SX format	22 µm

If the tip protursion of any one head is under the specitication, it is recommended that the upper drum assembly should be replaced early before occurring the trouble at the playing back.
For the upper drum replacement, refer to Section 3-2 in the maintenance manual part 2, volume-1.

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-537-01
- Head tip protrusion measurement gauge: J-6530-650-A
- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

5-3-1. Head Tip Protrusion Measurement

Preparations for VTR

1. Remove the top plate. (Refer to Section 2-3-1.)
2. Remove the plate MD assembly. (Refer to Section 2-4.)
3. Remove the cassette compatment. (Refer to Section 2-5.)
4. Remove the brush slip ring assembly. (Refer to Section 5-3-2.)
5. Clean the outer circumference and video heads of the upper drum (shaded portions in Figure 1). (Refer to Section 5-2-3 for the cleaning method.)

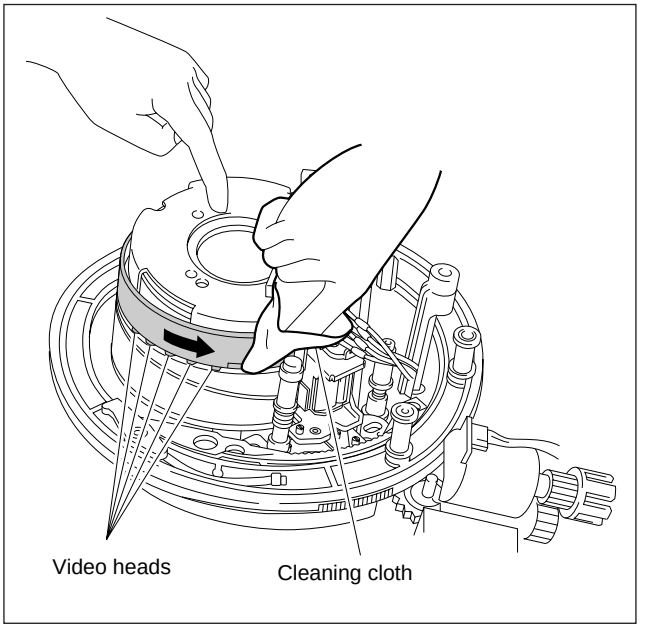


Figure 1. Cleaning of Drum

Preparations for Head Tip Protrusion Measurement Gauge

This gauge is the precision equipment. Handle with care.

1. Loosen the adjustment screw fully (by turning it counterclockwise).
2. Clean the probe, positioning flange, and portion touching the drum of two legs. (Refer to Figure 3.)

Note

Do not apply excessive force to the probe during cleaning. If a deposit of µm order exists, measurement cannot be performed accurately.

Setting of Head Tip Protrusion Measurement Gauge

Note

Being careful not to damage the tape-running surface and video heads of the drum, set the gauge.

1. Turn the upper drum manually counterclockwise (↺) to align the screw hole (⇨ mark on the board cover) to the rib of the threading ring as shown in Figure 2.
   Note
   The upper drum position is determined as described above to put the probe of the head tip protrusion measurement gauge on the absence of a head. The video head that first measures the protrusion value is the ADV A5 head.
2. Check the value that the dial gauge pointer reads.
3. Position a probe between the C-B head and Dummy head. (Refer to Figure 2.)
4. Press the tip of two legs against the outer circumference of the drum's upper surface while keeping the base plate of the measurement gauge in parallel with the upper surface of the drum. Be sure to keep the probe of the measurement gauge sufficiently away from the drum.
5. Lower the measurement gauge slowly until the ridges of the two legs and positioning flange touch the upper drum while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by the arrow). (Refer to Figure 3.)
   Notes
   - Before placing a measurement gauge on the drum, ensure that the adjustment screw has been loosened fully.
   - Perform carefully and slowly so that the probe of a measurement gauge does not touch the outer circumference or video head on the drum. (Lower so that the probe is slightly higher than the two legs.)
   - After placing the measurement gauge on the drum, be sure to support it with hand at all time.
     If it is loose carelessly, the drum and measurement gause will turn and damage the peripheral parts.
6. Check to see the followings:
   - The probe is in the middle of the adjacent heads.
   - The positioning flange adheres closely to the outer circumference of the drum's upper surface.
   - The legs adhere closely to the outer circumference of the drum's upper surface.
   - The value that the dial gauge pointer reads is the same as before setting (in step 2).
7. Turn the adjustment screw clockwise until the dial gauge pointer rotates approximately a half turn.
8. Turn the outer frame of the dial gauge to align zero (0) to the pointer.

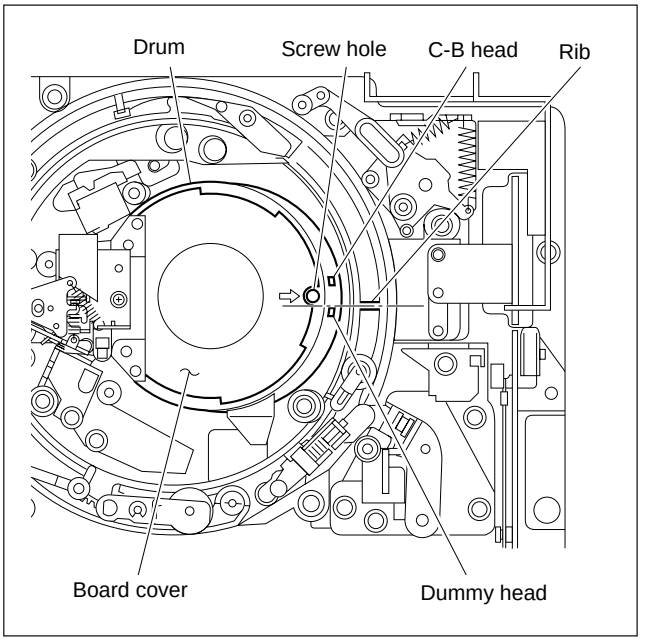


Figure 2. Setting of Drum Position

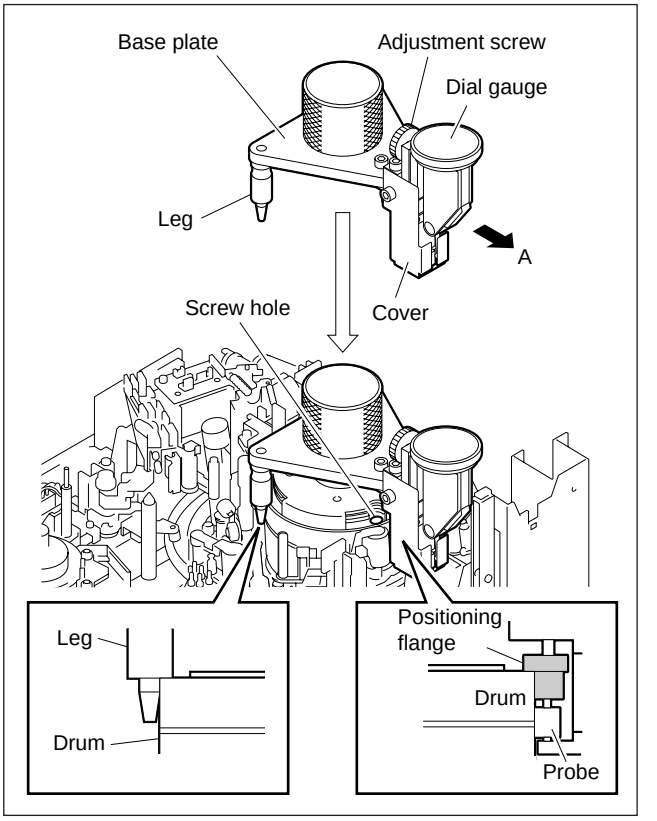


Figure 3. Setting of Head Tip Protrusion Measurement Gauge

Measurement of Head Tip Protrusion

Note

When turning the upper drum manually, hold the cover of the measurement gauge by your hand to not come to turn the gauge with the drum rotation.

1. Turn the upper drum manually counterclockwise (↺) very slowly to approach a video head aside of the probe. (Refer to <A> in Figure 4.)
2. Read the dial gauge pointer. (= Ha)

   Note

   The scale of the dial gauge is 2 μm (0.002 mm) pitch. Clockwise: +. Counterclockwise: −.
3. Turn the upper drum manually counterclockwise (↺) very slowly to center the video head in the probe. (Refer to <B> in Figure 4.)
4. Read the dial gauge pointer. (= Hb)
5. Calculate the real head tip protrusion Hr with the Ha and Hb.
   Hr = Hb − Ha
6. Calculate the head tip protrusion Hr for all heads with steps 1 through 5 performing .
7. Measure and calculate the real head tip protrusion Hr for all heads again.

   Note

   Do it two times for fear of measuring error.

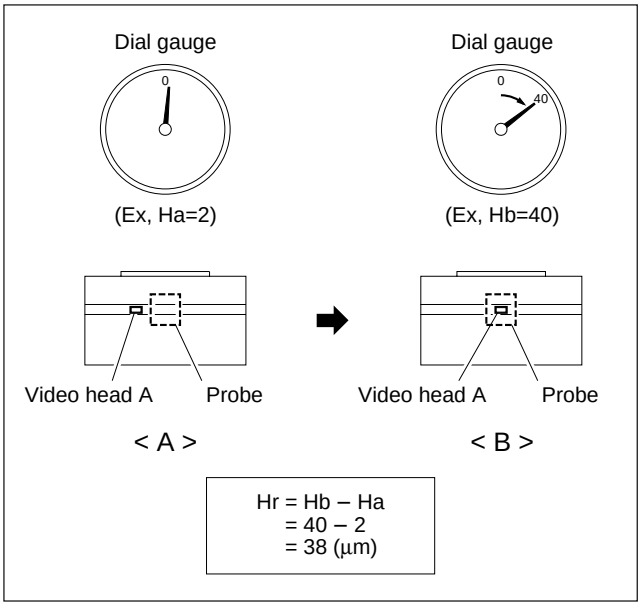


Figure 4. Example of Head Tip Protrusion Measurement

This table is in measure order of the heads.

Head name	Spec. (μm)	Head tip protrusion (Hr = Hb − Ha) First time	Second time
Dummy	–	(No need for measurement)	
Dummy	–	(No need for measurement)	
Dummy	–	(No need for measurement)	
ADV A5	22	= – | = –	
ADV B5	22	= – | = –	
ADV A6	22	= – | = –	
ADV B6	22	= – | = –	
Y-A	20	= – | = –	
C-A	20	= – | = –	
Dummy	–	(No need for measurement)	
Dummy	–	(No need for measurement)	
Dummy	–	(No need for measurement)	
Dummy	–	(No need for measurement)	
ADV A1	22	= – | = –	
ADV B1	22	= – | = –	
ADV A2	22	= – | = –	
ADV B2	22	= – | = –	
Y-B	20	= – | = –	
C-B	20	= – | = –	

Removal of Head Tip Protrusion Measurement Gauge

1. Turn the upper drum manually counterclockwise (↺) very slowly to move a video head aside from the probe.
2. Loosen the adjustment screw fully (by turning it counterclockwise).
3. Lift up the positioning flange from the outer circumference of the drum's upper surface to a few millimeters, and then lift the measurement gauge slowly and remove it while pushing two legs against the outer circumference of the drum's upper surface (applying force slightly to the measurement gauge in the direction indicated by arrow A). (Refer to Figure 3.)

   Note

   Perform carefully and slowly so that the probe of a measurement gauge does not touch the outer circumference or video head on the drum.

5-3-2. Brush Slip Ring Assembly Removal/Reinstallation

Preparing tools

- Torque screwdriver (6 kg•cm) (JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A

Note

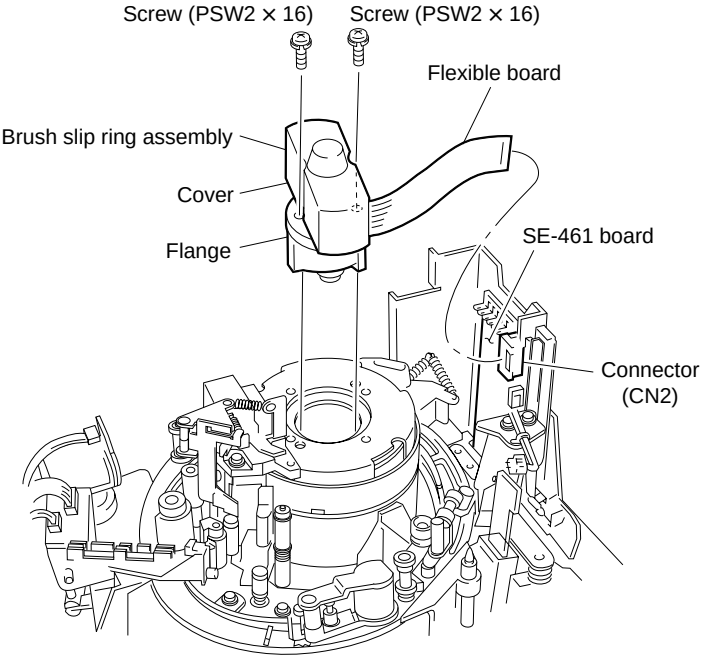
If replacing the brush slip ring assembly, refer to Section 3 in the maintenance manual part 2, volume-1.

Removal

1. Unlock the connector CN2, then disconnect the flexible board from the connector CN2 on the SE-461 board.
   Note
   To unlock the connector CN2, pull the slider (white) of the connector.
2. Unscrew the two screws to remove the brush slip ring assembly.
   Note
   Do not apply any force forcibly to the brush slip ring assembly.
3. To take out the screws, turn the brush slip ring assembly upside down.
   Note
   Be careful not to drop these screws in the cover.

Reinstallation

4. Insert the two screws removed in step 2 into the screw holes of the brush slip ring assembly.
5. Reinstall the brush slip ring assembly in the direction shown in the figure.
6. Tighten the two screws alternately and gradually while pushing both sides of the flange uniformly.
   Tightening torque: 14.7×10^{-2} N•m {1.5 kgf•cm}
7. Insert the flexible board into the connector CN2 on the SE-461 board, then lock the connector.
   Notes
   - Be sure to insert the flexible board into the connector CN2 with unlocked.
     (Refer to **Note** on step 1 for "Unlock".)
   - To lock the connector CN2, press in the slider (white) of the connector.



Tightening torque: 14.7×10^{-2} N•m {1.5 kgf•cm}

Section 6
Spare Parts

6-1. Notes on Repair Parts

1. Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

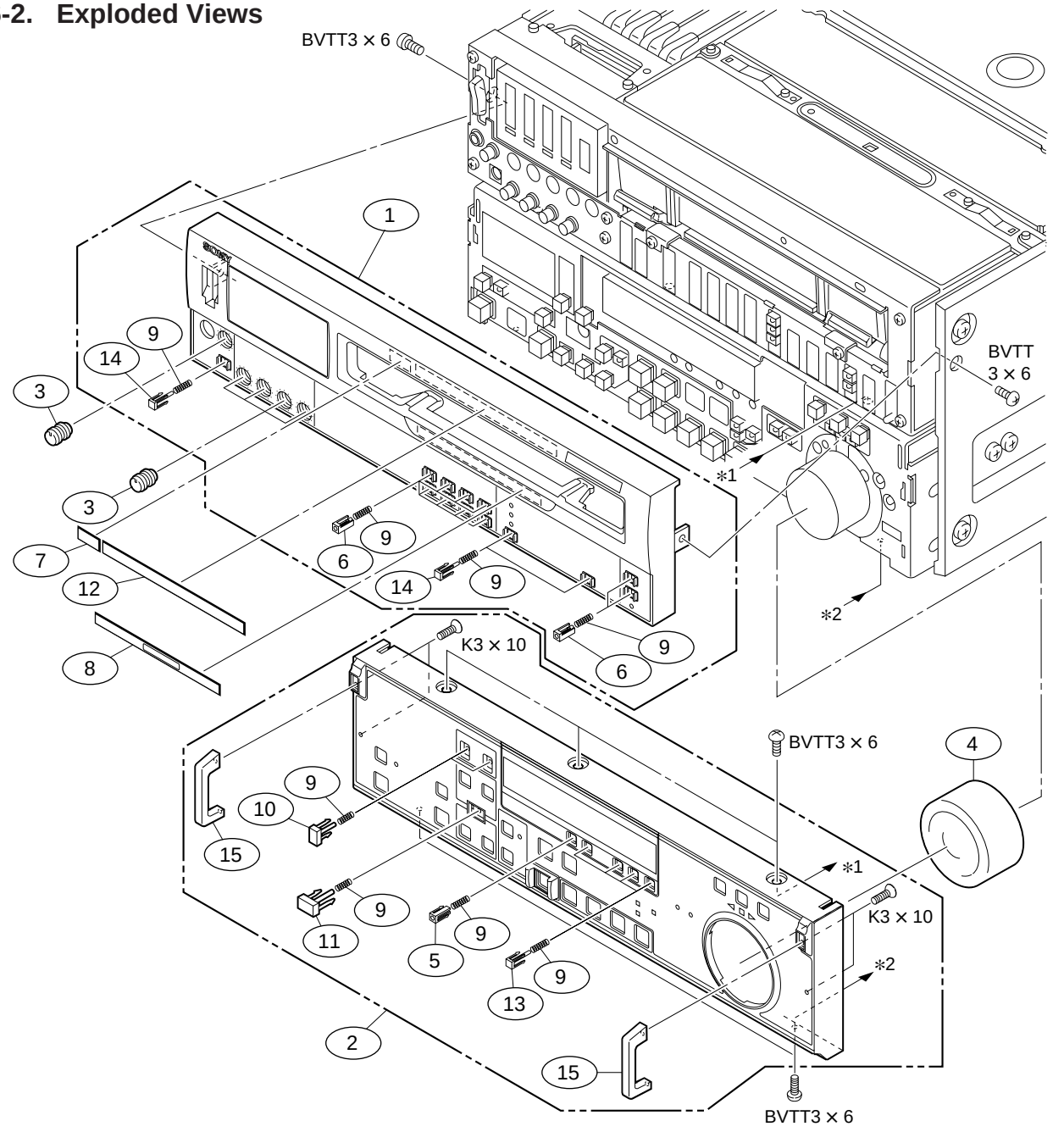
2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

6-2. Exploded Views



No.	Part No.	SP	Description
1	A-8278-869-D	o	PANEL ASSY, FRONT
2	A-8278-870-C	o	PANEL ASSY, KEY
3	X-3167-825-1	o	KNOB ASSY(P), VOL
4	3-180-633-04	s	RUBBER, DIAL KNOB
5	3-180-822-05	s	KEY TOP 6x6, USE
6	3-180-822-12	s	KEY TOP 6x6, USE
7	3-184-994-03	o	ISR STICKER (S)
8	3-604-813-11	o	A/D LABEL
9	3-611-769-01	s	SPRING, COMPRESSION
10	3-615-786-02	s	TOP, KEY 7x11
11	3-615-810-02	s	TOP, KEY 9x16
12	3-616-384-01	o	LABEL(DNW-A65)
	3-616-385-01	o	LABEL(DNW-A65P)
13	3-696-774-02	s	KEY TOP, 6x6
14	3-696-774-12	o	KEY TOP, 6x6
15	3-717-425-31	o	HANDLE
	7-685-247-19	s	SCREW +K 3x10 TAPPING TYPE2
	7-685-871-09	s	SCREW +BVTT 3x6(S)

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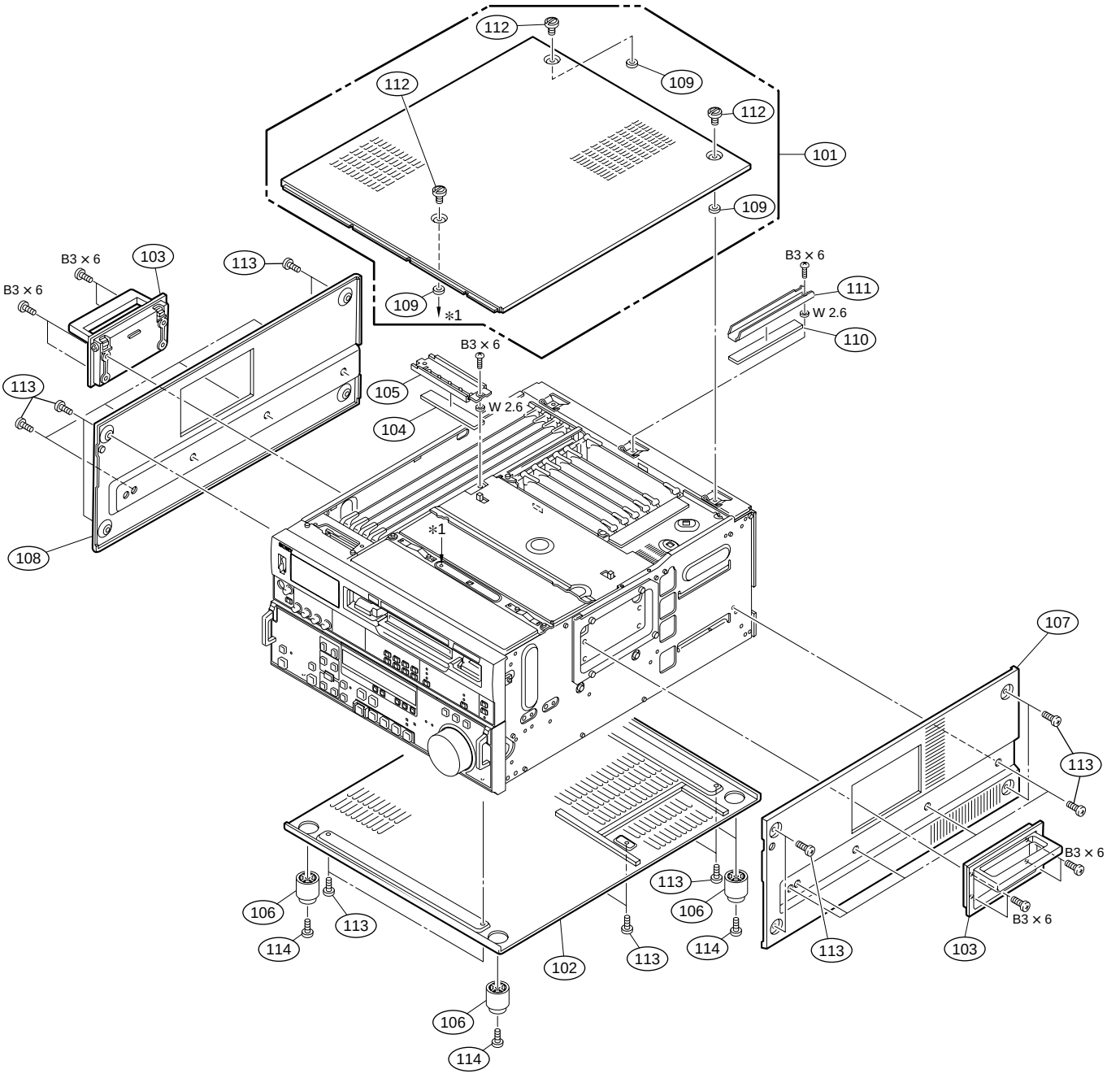


No.	Part No.	SP	Description
101	A-8278-844-A	o	LID ASSY, UPPER
102	X-3604-661-4	o	PLATE ASSY, BOTTOM
103	X-3642-018-3	o	HANDLE ASSY
104	3-171-410-01	o	RETAINER(S), PC BOARD
105	3-180-641-01	o	PLATE(L), PC BOARD RETAINER
106	3-604-930-02	s	FOOT, RUBBER
	3-642-656-01	s	FOOT, PLASTIC
107	3-615-773-02	o	CABINET(RIGHT)
108	3-615-774-01	o	CABINET(LEFT)
109	3-688-102-01	o	SPACER, M4

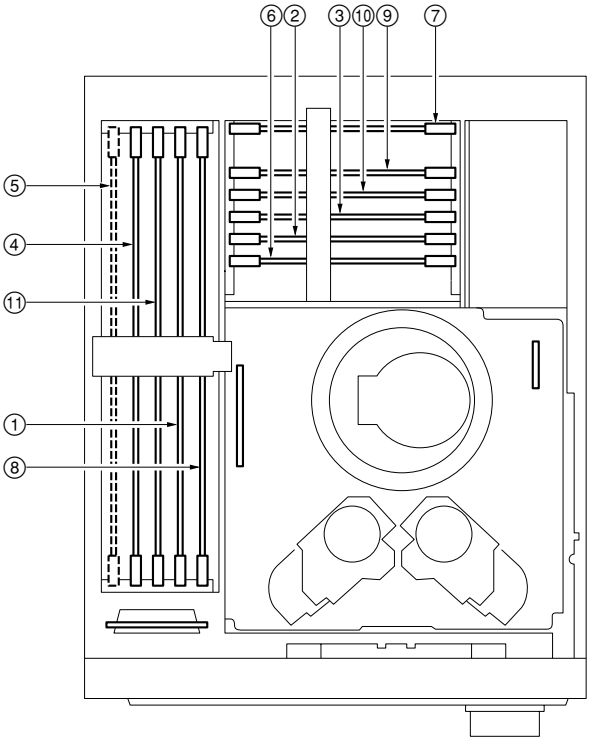
No.	Part No.	SP	Description
110	3-696-882-02	o	CUSHION, PC BOARD RETAINER
111	3-696-887-01	o	RETAINER (S), PC BOARD
112	3-717-392-02	o	SCREW, LID
113	3-733-690-01	s	SCREW +B 4x6
114	7-682-664-09	s	SCREW +PS 4x14 (When the foot made of rubber.)
	7-682-666-09	s	SCREW +PS 4x20 (When the foot made of plastic.)
	7-623-923-11	s	WASHER 2.6x3.0, PLASTIC
	7-682-547-09	s	SCREW +B 3x6

6-3. Plug-in Boards

No.	Board Name	Part No.	SP	Description
1	APR-40C	A-8320-170-A	o	MOUNTED CIRCUIT BOARD, APR-40C
2	AU-260	A-8319-243-A	o	MOUNTED CIRCUIT BOARD, AU-260 (For DNW-A65)
		A-8319-245-A	o	MOUNTED CIRCUIT BOARD, AU-260P (For DNW-A65P)
3	DM-89	A-8275-154-B	o	MOUNTED CIRCUIT BOARD, DM-89 (For DNW-A65)
		A-8275-088-B	o	MOUNTED CIRCUIT BOARD, DM-89P (For DNW-A65P)
4	DPR-118 Note)	A-8320-172-A	o	MOUNTED CIRCUIT BOARD, DPR-118C
5	DPR-150	–	–	BKNW-124
6	EQ-75C	A-8320-176-A	o	MOUNTED CIRCUIT BOARD, EQ-75C
7	SDI-41C	A-8320-174-A	o	MOUNTED CIRCUIT BOARD, SDI-41C
8	SS-83	A-8319-289-A	o	MOUNTED CIRCUIT BOARD, SS-83
9	TBC-23A	A-8319-295-A	o	MOUNTED CIRCUIT BOARD, TBC-23A (For DNW-A65)
		A-8319-297-A	o	MOUNTED CIRCUIT BOARD, TBC-23AP (For DNW-A65P)
10	TBC-24	A-8275-156-A	o	MOUNTED CIRCUIT BOARD, TBC-24 (For DNW-A65)
		A-8275-087-A	o	MOUNTED CIRCUIT BOARD, TBC-24P (For DNW-A65P)
11	VPR-47	A-8319-301-A	o	MOUNTED CIRCUIT BOARD, VPR-47 (For DNW-A65)
		A-8319-303-A	o	MOUNTED CIRCUIT BOARD, VPR-47P (For DNW-A65P)

Notes

- After the plug-in board replacement, the settings of switches and menus, electrical alignments, and operating confirmation are necessary for a new board. Refer to the maintenance manual Part 2 Volume-1.
- This is the part No. for DPR-118 board only, not including the optional board (DPR-119 board).
  When the DPR-118 board is provided with a DPR-119 board (BKNW-118), remove the DPR-119 board from the DPR-118 board before replacing the DPR-118 board to a new DPR-118 board.
- The DPR-150 board is a optional board (BKNW-124). For the optional board, please order the standard products.



< Top View >

6-4. Packing Materials and Supplied Accessories List

Q'ty	Part No.	SP	Description
1pc	∗----------	o	CABLE, REMOTE CONTROL 9P
1pc	3-181-533-01	o	CUSHION (LOWER)
1pc	3-181-534-01	o	CUSHION (UPPER)
1pc	3-181-535-01	o	SPACER (A)
1pc	3-181-536-01	o	SPACER (B)
1pc	3-201-268-01	o	INDIVIDUAL CARTON (for DNW-A65)
	3-201-269-01	o	INDIVIDUAL CARTON (for DNW-A65P)
4pcs	7-682-965-01	s	SCREW +PSW 4x16

∗ : Please order the standard product “RCC-5G”.

Note

DNW-A65 and DNW-A65P do not have their power cord as a supplied accessory.
Refer to Section 6-5.

6-5. Power Cords List

Q'ty	Part No.	SP	Description
<For customers in the U.S.A. and Canada>			
1pc	⚠ 1-557-377-11	s	CORD, POWER
1pc	3-613-640-01	o	HOLDER (C), PLUG (Brown)
<For customers in the United Kingdom>			
1pc	⚠ 1-782-165-11	o	CORD, POWER
1pc	3-613-640-01	o	HOLDER (C), PLUG (Brown)
<For customers in European contries except the United Kingdom>			
1pc	⚠ 1-782-164-11	o	CORD, POWER
1pc	3-613-640-01	o	HOLDER (C), PLUG (Brown)

6-6. Fixtures List

Part No.	SP	Description
J-6035-070-A	o	EXTRACTION TOOL (for PLCC socket)
J-6080-029-A	o	SMALL DENTAL MIRROR (Round type ø12)
J-6086-570-A	o	REFERENCE FLAT PLATE
J-6152-450-A	o	WIRE CLEARANCE CHECK GAUGE SET
J-6251-090-A	o	TORQUE SCREWDRIVER'S HEXAGONAL BIT (d=2.5 mm, l=120 mm)
J-6323-440-A	o	TORQUE SCREWDRIVER'S HEXAGONAL BIT (d=0.89 mm, l=50 mm)
J-6323-420-A	o	TORQUE SCREWDRIVER'S BIT (+2 mm, l=75 mm)
J-6323-430-A	o	TORQUE SCREWDRIVER'S BIT (+3 mm, l=90 mm)
J-6252-510-A	o	TORQUE SCREWDRIVER (6 kg•cm) (0.6 N•m)
J-6252-520-A	o	TORQUE SCREWDRIVER (12 kg•cm) (1.2 N•m)
J-6269-810-A	o	EXTENSION BOARD (S), EX-377
A-8277-211-A	o	EXTENSION BOARD (L), EX-555
A-8277-212-A	o	EXTENSION BOARD (S), EX-556
J-6320-870-A	o	REEL MOTOR SHAFT SLANTNESS CHECK FIXTURE
J-6320-880-A	o	CASSETTE REFERENCE PLATE (L)
J-6322-610-A	o	TAPE GUIDE ADJUSTMENT DRIVER
J-6329-350-A	o	REEL TABLE HEIGHT GAUGE
1-952-684-11	o	EXTENSION CABLE (14P)
A-8321-333-A	o	POWER CABLE ASSEMBLY (for POWER SUPPLY UNIT)
3-184-527-01	o	CLEANING CLOTH (15 cm x 15 cm)
7-432-114-11	o	LOCKING COMPOUND, 1401B (200 g)
7-651-000-10	o	SONY GREASE, SGL-601 (50 g)
7-661-018-18	o	DIAMOND OIL, NT-68 (50 ml)
7-700-736-01	o	L-SHAPED HEXAGONAL WRENCH (d=1.27 mm)
7-700-736-04	o	L-SHAPED HEXAGONAL WRENCH (d=2.5 mm)
7-700-736-05	o	L-SHAPED HEXAGONAL WRENCH (d=1.5 mm)
7-700-736-06	o	L-SHAPED HEXAGONAL WRENCH (d=0.89 mm)
7-700-766-04	o	HEXAGONAL WRENCH DRIVER (d=2.5 mm)
8-960-075-01	o	ALIGNMENT TAPE, SR5-1 (for 525/60 system)
8-960-075-11	o	ALIGNMENT TAPE, SR2-1 (for 525/60 system)
8-960-075-51	o	ALIGNMENT TAPE, SR5-1P (for 625/50 system)
8-960-075-61	o	ALIGNMENT TAPE, SR2-1P (for 625/50 system)
8-960-096-01	o	ALIGNMENT TAPE, CR2-1B (for analog Betacam NTSC)
8-960-096-41	o	ALIGNMENT TAPE, CR5-1B (METAL PARTICLE TAPE) (for analog Betacam NTSC)
8-960-097-44	o	ALIGNMENT TAPE, CR5-2A (OXIDE TAPE) (for analog Betacam NTSC)
8-960-097-45	o	ALIGNMENT TAPE, CR8-1A (OXIDE TAPE) (for analog Betacam NTSC)
8-960-096-51	o	ALIGNMENT TAPE, CR2-1B PS (for analog Betacam PAL)
8-960-096-91	o	ALIGNMENT TAPE, CR5-1B PS (METAL PARTICLE TAPE) (for analog Betacam PAL)
8-960-096-86	o	ALIGNMENT TAPE, CR8-1B PS (METAL PARTICLE TAPE) (for analog Betacam PAL)
8-960-098-44	o	ALIGNMENT TAPE, CR5-2A PS (OXIDE TAPE) (for analog Betacam PAL)
8-960-098-45	o	ALIGNMENT TAPE, CR8-1A PS (OXIDE TAPE) (for analog Betacam PAL)
9-911-053-00	o	THICKNESS GAUGE
9-919-573-01	o	CLEANING LIQUID
J-6332-240-A	o	VISC PHASE ADJUSTING TOOL (for DNW-A65P only)
J-6530-650-A	o	HEAD TIP PROTRUSION MEASUREMENT GAUGE
J-6190-800-A	o	TENSION REGULATOR SLANTNESS CHECK TOOL

Part No.	SP	Description
A-8319-485-A	o	IC MEMORY CARD BOX, CDS-20 ASSEMBLY
1-772-003-11	o	CARD (2 MB), MEMORY
1-772-004-11	o	CARD (4 MB), MEMORY

Appendix A
Setting Check Sheet

It is reccomended to copy these check sheets and write down the setup conditions (switch and so on) under the application.
If the setting is changed temporarily by changing operating condition, the setting can be reset easily.
It is recommended to attach the sheets to the unit when check, maintenance and repair.
If the unit is used frequently by changing the combination of each system, making the sheets are convenient.
(Make use of the check sheets in prevention of setting error.)

Model name: DNW-_____ Serial No.: _____

- Optional hardware

  SDTI output : ☐ Not installed
  ☐ Installed (BKNW-118)
  ☐ Installed (BKNW-124)

- Firmware

  SY1 ROM version: _____
  SY2 ROM version: _____
  SY3 ROM version: _____ (When the BKNW-124 is used.)
  SV1 ROM version: _____
  DT ROM version: _____

- RS-232C baud rate: _____ bps

- Hours meter

  Write down the value of hours meter when checking, servicing and maintaining.

ITEM	Date	Hours meter
H01: OPERATION HOURS	/	
H02: DRUM RUNNING HOURS	/	
H03: TAPE RUNNING HOURS	/	
H04: THREADING COUNTER	/	
H12: DRUM RUNNING HOURS(Resettable)	/	
H13: TAPE RUNNING HOURS(Resettable)	/	
H14: THREADING COUNTER(Resettable)	/	
H15: TTP FAN OPERATION HOURS(Resettable)	/	

Connector panel

Switch	Factory setting	Setting			
Reference video input 75 Ω	ON	☐ ON	☐ OFF		

Upper control panel

Switch		Factory setting	Setting			
AUDIO MONITOR	L	CH-1	☐ CH-1	☐ CH-2	☐ CH-3	☐ CH-4
	R	CH-2	☐ CH-1	☐ CH-2	☐ CH-3	☐ CH-4
TC		AUTO	☐ LTC	☐ AUTO	☐ VITC	
DF/NDF		DF (525/60)	☐ DF	☐ NDF		
REMOTE 1 (9P)		LOCAL	☐ Lighting (REMOTE)		☐ Lightless (LOCAL)	
REMOTE 2 (50P)		LOCAL	☐ Lighting (REMOTE)		☐ Lightless (LOCAL)	

Sub control panel

Switch	Factory setting	Setting		
CONTROL PANEL	INT	☐ EXT	☐ INT	
CHARACTER	ON	☐ OFF	☐ ON	
DOLBY NR	ON	☐ OFF	☐ ON	
PROCESS CONTROL	LOCAL	☐ REMOTE	☐ MENU	☐ LOCAL
VIDEO	PRESET	☐ PRESET	☐ MANUAL	
CHROMA	PRESET	☐ PRESET	☐ MANUAL	
SET UP/BLACK LEVEL	PRESET	☐ PRESET	☐ MANUAL	
Y/C DELAY	PRESET	☐ PRESET	☐ MANUAL	
CHROMA PHASE	PRESET	☐ PRESET	☐ MANUAL	
GOOD SHOT	REC	☐ REC INHIBIT	☐ REC	
KEY INHIBIT	OFF	☐ ON	☐ OFF	
CAPSTAN LOCK	4FD	☐ 2FD	☐ 4FD	☐ 8FD (625/50)

Shorting plugs on the board

Note

Never change the setting of Factory use shorting plugs.

Board	Name	Channel	Ref. No.	Factory setting	Setting
APR-40C	Betacam PB headroom	CH1	COR101	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH2	COR201	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH3	COR301	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH4	COR401	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
	Audio output level	CH1	COR501	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
		CH2	COR601	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
		CH3	COR701	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
		CH4	COR801	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
	Audio output headroom	CH1	COR500	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH2	COR600	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH3	COR700	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		CH4	COR800	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
	Monitor output level	L	COR902	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
		R	COR952	+4 dBm/600 Ω	☐ 20 ☐ 18 ☐ 16
	Monitor output headroom	L	COR900	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
		R	COR950	20 dB	☐ +4 ☐ 0 ☐ –3 ☐ –20
	Variable monitor output level	L	COR901	Fixed (UNITY)	☐ Fixed ☐ Variable
		R	COR951	Fixed (UNITY)	☐ Fixed ☐ Variable
SS-83	Factory use		COR100	OPEN	–
	Factory use		COR101	OPEN	–

Switches on the board

Note

Never change the setting of Factory use switches.

Board	Switch No.	: Name			Factory setting	Setting
AU-260	S500	: CH1 head tune			Adjusted condition	–
	S600	: CH2 head tune			Adjusted condition	–
DM-89	S101	: Y-RF LPF & EQ TEST			NORMAL POSITION	–
	S102	: Factory use			NORMAL POSITION	–
	S301	: C-RF LPF & EQ TEST			NORMAL POSITION	–
	S302	: Factory use			NORMAL POSITION	–
	S501	: Factory use			ON	–
	S901	1 – 4 : Factory use			OFF (OPEN)	–
TBC-23A	S1	1 : Y MUTE			OFF (OPEN)	
		2 : C MUTE			OFF (OPEN)	
		3, 4 : Factory use			OFF (OPEN)	–
		5 : COMB			OFF (OPEN)	
		6 : TBC TEST			OFF (OPEN)	–
		7 : Factory use			OFF (OPEN)	–
		8 : VIDEO PHASE			OFF (OPEN)	
	S500	1 – 4 : Factory use			OFF (OPEN)	–
SS-83	S101	1*1 : FLASH MEMORY			OFF (OPEN)	–
		2 : ANA AUTO-TRACKING			OFF (OPEN)	
		3 : ANA DISABLE			OFF (OPEN)	
		4*2 : SV ERR DISABLE			OFF (OPEN)	–
	S1100	1 : EXTEND MENU			OFF (OPEN)	
		2 : MAINTE MODE			OFF (OPEN)	
		3 : Factory use			OFF (OPEN)	–
		4 : RS232C DEBUG			OFF (OPEN)	
		5 – 8 : Factory use			OFF (OPEN)	–
	S1102	Never change the settings of S1102 switch since each switch is set according to the characteristics of the unit.				
		1, 2 : Factory use			OFF (OPEN)	–
		3 – 6 : Model ID		DNW-A65/A65P	TTV 4065 N/4065 P	
			3	OFF (OPEN)	ON (CLOSE)	–
			4	OFF (OPEN)	OFF (OPEN)	–
			5	ON (CLOSE)	ON (CLOSE)	–
			6	OFF (OPEN)	OFF (OPEN)	–
		7 : J/UC			ON (CLOSE)	–
		8 : 525/625		DNW-A65:	OFF (OPEN)	–
				DNW-A65P:	ON (CLOSE)	–
	S1900	1 – 8 : Factory use			OFF (OPEN)	–
	S2100	1 – 8 : Factory use			OFF (OPEN)	–
	S2701	1 : Factory use			OFF (OPEN)	–
		2 : DT MODE			OFF (OPEN)	
		3, 4 : Factory use			OFF (OPEN)	–

∗1, ∗2: Never change the switches S101-1 and S101-4.

Setup Menu Settings in 525/60 System

Note

When Bank 1 to 4 menu is recalled, the current menu will be overwritten.
Be sure to check the current menu first, before recall Bank 1 to 4.

Main Menu

ITEM-000 series: Operational parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
001: PREROLL TIME	5S					
002: CHARACTER H-POSITION	1C					
003: CHARACTER V-POSITION	57					
005: DISPLAY INFORMATION SELECT	T&STA					
006: LOCAL FUNCTION ENABLE	ST&EJ					
007: TAPE TIMER DISPLAY	+−12H					
009: CHARACTER TYPE	WHITE					
011: CHARACTER V-SIZE	×1					
013*1: 525/625 SYSTEM SELECT	OFF	–	–	–	–	–

*1: ITEM-013 is no relation with Bank.

ITEM-B00 series: Menu bank parameter

This series is not necessary to write down the setting.
All settings of B00 series are OFF on the normal state. Set to ON only when ITEM is carried out.
After finishing, all settings of B00 series return to OFF automatically.

ITEM	Factory setting
B01: RECALL BANK 1	OFF
B02: RECALL BANK 2	OFF
B03: RECALL BANK 3	OFF
B04: RECALL BANK 4	OFF
B11: SAVE BANK 1	OFF
B12: SAVE BANK 2	OFF
B13: SAVE BANK 3	OFF
B14: SAVE BANK 4	OFF
B20: RESET SETUP	OFF

Extended Menu

ITEM-100 series: Operational panel parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101: SELECTION FOR SEARCH DIAL ENABLE		DIAL					
102: MAXIMUM SPEED		MAX					
103: AUDIO SELECTED LINE OUT		MANU					
104: AUDIO MUTING TIME		OFF					
105: REFERENCE SYSTEM ALARM		ON					
106: CAPSTAN LOCK		SW					
111: TSO/FEED PLAY		DIS					
115: PHASE LOCK IN VARIABLE X3		OFF					
116: JOG DIAL RESPONSE		TYPE1					
117: CONTROL PANEL SELECTION		SW					
118: KEY INHIBIT SWITCH EFFECTIVE AREA							
SUB-ITEM	1: REMOTE SELECT	DIS					
	2: MONITOR SELECT	DIS					
	3: CONTROL PANEL	DIS					
119: VARIABLE SPEED LIMIT IN KEY PANEL CONTROL		OFF					
120: CTL LOCK IN VAR/SHTL		OFF					

ITEM-200 series: Remote interface parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
201: PARA RUN	DIS					

ITEM-300 series: Editing parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
301: VAR SPEED RANGE FOR SYNCHRONIZATION	−1~+2					
302: CAPSTAN RE-LOCKING DIRECTION	DECEL					
306: DMC INITIAL SPEED	MANU					
307: AUTO-DELETION FOR INCONSISTENT DATA	MANU					
320: DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					

ITEM-400 series: Preroll parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
401: FUNCTION MODE AFTER CUE-UP	STOP					
402: TIME REFERENCE FOR PREROLL	CTL					
403: AUTOMATIC PREROLL REFERENCE ENTRY	DIS					
405: CUE-UP BY CTL	CAP					

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ITEM-500 series: Tape protection parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501: STILL TIMER	8M					
502: TAPE PROTECTION MODE FROM SEARCH	STEP					
503: TAPE PROTECTION MODE FROM STOP	STDBY					
504: DRUM ROTATION IN STANDBY OFF	OFF					
505: STILL TENSION	NORM					

ITEM-600 series: Time code generator parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
606: TC OUTPUT SIGNAL IN REGEN MODE	TAPE					
616: SDTI-CP OUTPUT LTC OVERRIDE (When BKNW-124 is used only.)	DIS					

ITEM-700 series: Video control parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
703: BLANK LINE SELECT							
SUB-ITEM	0: All line	–––					
	12: 12 line	BLANK					
	13: 13 line	BLANK					
	14: 14 line	BLANK					
	15: 15 line	BLANK					
	16: 16 line	BLANK					
	17: 17 line	BLANK					
	18: 18 line	BLANK					
	19: 19 line	BLANK					
	20: 20 line	BLANK					
705: EDGE SUBCARRIER REDUCER MODE		AUTO					
706: VERTICAL BLANKING V SHIFT		ON					
707: FORCED VERTICAL INTERPOLATION OFF		AUTO					
709: CAV LEVEL FORMAT							
SUB-ITEM	1: OUTPUT CAV LEVEL	B-CAM					
710: INTERNAL VIDEO SIGNAL GENERATOR		CB75					
712: VIDEO PROCESS ON CAP LOCK 2FIELD		OFF					
713: VIDEO SETUP REFERENCE LEVEL							
SUB-ITEM	0: MASTER LEVEL	7.5%					
	3: BETACAM PB LEVEL	MSTER					
	4: OUTPUT LEVEL	MSTER					
714: VIDEO ADJUST RANGE		–3~+3					
715: VIDEO GAIN CONTROL		800H					
716: CHROMA GAIN CONTROL		800H					

(Continued)

ITEM-700 series (Continued)

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
717: CHROMA PHASE CONTROL	80H					
718: SETUP LEVEL	110H					
719: SYSTEM PHASE SYNC	80H					
720: SYSTEM PHASE SC	0H					
721: Y/C DELAY	800H					
726: H BLANKING WIDTH	NAROW					
728: OUTPUT SCH PHASE	800H					

ITEM-800 series: Audio control parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802: DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
805: AUDIO MONITOR OUTPUT MIXING	RMS					
806: LEVEL METER SCALE	PEAK 0					
807: AUDIO OUTPUT PHASE	80					
808: INTERNAL AUDIO SIGNAL GENERATOR	OFF					
809: AUDIO LEVEL METER DIMMER CONTROL	0					
817: EMPHASIS	OFF					

ITEM-900 series: Digital process parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
903: FREEZE MODE	FIELD					
904: FREEZE CONTROL FROM KEY PANEL	MOMNT					
905: AUTO FREEZE CONTROL	DIS					
906: STOP FREEZE CONTROL	DIS					
914: SDTI-CP OUTPUT BIT RATE (When BKNW-124 is used only.)	50I					
915: SDTI-CP OUTPUT FORWARD ERROR CORRECTION (When BKNW-124 is used only.)	ON					

ITEM-F00 series: Adjustment use only

This series is not necessary to setting.
In the normal operation, use the factory settings.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01: AUDIO NR IN SP MODE	ON					
F02: EMERGENCY TAPE PROTECTION	ENA					
F13: TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16: DEVICE TYPE MODIFY	0					
F21: PROCESS CONT VR	ON*					
F34: STOP PINCH OFF TIME	5M					

*: When the SY1 ROM version is eralier than 1.33, the ITEM-F21's factory setting is "OFF".

ITEM-G00 series: Shot mark operation parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
G01: SEARCH TYPE SELECT		ALL					
G02: LISTING TYPE SELECT							
SUB-ITEM	REC START MARK	ON					
	SHOT MARK 1	ON					
	SHOT MARK 2	ON					
	POST MARK	ON					

Setup Menu Settings in 625/50 System

Note

When Bank 1 to 4 menu is recalled, the current menu will be overwritten.
Be sure to check the current menu first, before recall Bank 1 to 4.

Main Menu

ITEM-000 series: Operational parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
001: PREROLL TIME	5S					
002: CHARACTER H-POSITION	19					
003: CHARACTER V-POSITION	5D					
005: DISPLAY INFORMATION SELECT	T&STA					
006: LOCAL FUNCTION ENABLE	ST&EJ					
007: TAPE TIMER DISPLAY	+–12H					
009: CHARACTER TYPE	WHITE					
011: CHARACTER V-SIZE	×1					
013*1: 525/625 SYSTEM SELECT	OFF	–	–	–	–	–

*1: ITEM-013 is no relation with Bank.

ITEM-B00 series: Menu bank parameter

This series is not necessary to write down the setting.
All settings of B00 series are OFF on the normal state. Set to ON only when ITEM is carried out.
After finishing, all settings of B00 series return to OFF automatically.

ITEM	Factory setting
B01: RECALL BANK 1	OFF
B02: RECALL BANK 2	OFF
B03: RECALL BANK 3	OFF
B04: RECALL BANK 4	OFF
B11: SAVE BANK 1	OFF
B12: SAVE BANK 2	OFF
B13: SAVE BANK 3	OFF
B14: SAVE BANK 4	OFF
B20: RESET SETUP	OFF

Extended Menu

ITEM-100 series: Operational panel parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101: SELECTION FOR SEARCH DIAL ENABLE		DIAL					
102: MAXIMUM SPEED		MAX					
103: AUDIO SELECTED LINE OUT		MANU					
104: AUDIO MUTING TIME		OFF					
105: REFERENCE SYSTEM ALARM		ON					
106: CAPSTAN LOCK		SW					
111: TSO/FEED PLAY		DIS					
115: PHASE LOCK IN VARIABLE X3		OFF					
116: JOG DIAL RESPONSE		TYPE1					
117: CONTROL PANEL SELECTION		SW					
118: KEY INHIBIT SWITCH EFFECTIVE AREA							
SUB-ITEM	1: REMOTE SELECT	DIS					
	2: MONITOR SELECT	DIS					
	3: CONTROL PANEL	DIS					
119: VARIABLE SPEED LIMIT IN KEY PANEL CONTROL		OFF					
120: CTL LOCK IN VAR/SHTL		OFF					

ITEM-200 series: Remote interface parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
201: PARA RUN	DIS					
202: CF FLAG REPLY	8F					

ITEM-300 series: Editing parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
301: VAR SPEED RANGE FOR SYNCHRONIZATION	−1~+2					
302: CAPSTAN RE-LOCKING DIRECTION	ACCEL					
306: DMC INITIAL SPEED	MANU					
307: AUTO-DELETION FOR INCONSISTENT DATA	MANU					
320: DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					

ITEM-400 series: Preroll parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
401: FUNCTION MODE AFTER CUE-UP	STOP					
402: TIME REFERENCE FOR PREROLL	CTL					
403: AUTOMATIC PREROLL REFERENCE ENTRY	DIS					
405: CUE-UP BY CTL	CAP					

ITEM-500 series: Tape protection parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501: STILL TIMER	8M					
502: TAPE PROTECTION MODE FROM SEARCH	STEP					
503: TAPE PROTECTION MODE FROM STOP	STDBY					
504: DRUM ROTATION IN STANDBY OFF	OFF					
505: STILL TENSION	NORM					

ITEM-600 series: Time code generator parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
606: TC OUTPUT SIGNAL IN REGEN MODE	TAPE					
616: SDTI-CP OUTPUT LTC OVERRIDE (When BKNW-124 is used only.)	DIS					

ITEM-700 series: Video control parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
703: BLANK LINE SELECT							
SUB-ITEM	0: All line	–––					
	9: 9,322 line	BLANK					
	10: 10,323 line	BLANK					
	11: 11,324 line	BLANK					
	12: 12,325 line	BLANK					
	13: 13,326 line	BLANK					
	14: 14,327 line	BLANK					
	15: 15,328 line	BLANK					
	16: 16,329 line	BLANK					
	17: 17,330 line	BLANK					
	18: 18,331 line	BLANK					
	19: 19,332 line	BLANK					
	20: 20,333 line	BLANK					
	21: 21,334 line	BLANK					
	22: 22,335 line	BLANK					
	23: 23 line	HALF					
705: EDGE SUBCARRIER REDUCER MODE		AUTO					
706: VERTICAL BLANKING V SHIFT		ON					
707: FORCED VERTICAL INTERPOLATION OFF		AUTO					
710: INTERNAL VIDEO SIGNAL GENERATOR		CB100					
712: VIDEO PROCESS ON CAP LOCK 2FIELD		OFF					
714: VIDEO ADJUST RANGE		–3~+3					
715: VIDEO GAIN CONTROL		800H					
716: CHROMA GAIN CONTROL		800H					
717: CHROMA PHASE CONTROL		80H					

(Continued)

ITEM-700 series (Continued)

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
718: BLACK LEVEL	110H					
719: SYSTEM PHASE SYNC	80H					
720: SYSTEM PHASE SC	0H					
721: Y/C DELAY	800H					
726: H BLANKING WIDTH	NAROW					
728: OUTPUT SCH PHASE	800H					

ITEM-800 series: Audio control parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802: DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
805: AUDIO MONITOR OUTPUT MIXING	RMS					
806: LEVEL METER SCALE	PEAK 0					
807: AUDIO OUTPUT PHASE	80					
808: INTERNAL AUDIO SIGNAL GENERATOR	OFF					
809: AUDIO LEVEL METER DIMMER CONTROL	0					
817: EMPHASIS	OFF					

ITEM-900 series: Digital process parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
903: FREEZE MODE	FIELD					
904: FREEZE CONTROL FROM KEY PANEL	MOMNT					
905: AUTO FREEZE CONTROL	DIS					
906: STOP FREEZE CONTROL	DIS					
914: SDTI-CP OUTPUT BIT RATE (When BKNW-124 is used only.)	50I					
915: SDTI-CP OUTPUT FORWARD ERROR CORRECTION (When BKNW-124 is used only.)	ON					

ITEM-F00 series: Adjustment use only

This series is not necessary to setting.
In the normal operation, use the factory settings.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01: AUDIO NR IN SP MODE	ON					
F02: EMERGENCY TAPE PROTECTION	ENA					
F13: TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16: DEVICE TYPE MODIFY	0					
F21: PROCESS CONT VR	ON*					
F34: STOP PINCH OFF TIME	5M					

*: When the SY1 ROM version is eralier than 1.33, the ITEM-F21's factory setting is "OFF".

ITEM-G00 series: Shot mark operation parameter

ITEM		Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
G01: SEARCH TYPE SELECT		ALL					
G02: LISTING TYPE SELECT							
SUB-ITEM	REC START MARK	ON					
	SHOT MARK 1	ON					
	SHOT MARK 2	ON					
	POST MARK	ON					

Appendix B
Circuit Description and Overall Block Diagram

The following block diagrams are explained after circuit description.

• Overall (1/3) : Signal Processing System B-6
• Overall (2/3) : System/Servo Control System (1/2) B-8
• Overall (3/3) : System/Servo Control System (2/2) and DT Control System B-10

(1) Video Signal Processing System (CP-334, SDI-41C, and VPR-47 Boards)

Playback system

A Betacam SX video PB signal is reconstructed on the DPR-118 board. After that, the signal is sent to the video processing block through a video jog processing block.
After an analog Betacam video PB signal is reconstructed on the DM-89, TBC-24, and TBC-23A boards, it is sent to the video processing block on the VPR-47 board.
The video jog processing block converts the signal sent intermittently in the VAR/JOG PB mode into a continuous signal.
The SX video PB signal (signal output from the video jog processing block) or analog Betacam video PB signal is also input to the freeze memory block. The video data memorized in the freeze memory block is read in the freeze mode and input to the video processing block.
Each processing (gain adjustment, chroma phase adjustment, blanking addition, and line adder) is performed in the video processing block. The obtained information is sent to an encode block as the PB video signal (digital component video signal).
And when playing back the analog Betacam video PB only, the PB video signal input is also send to a frame control block as the SDTI outputs (optional BKNW-118/124). On the DPR-118C board, the bit rate of the PB video signal output from the frame control block is compressed into 1/10. After that, the compressed signal is sent to the DPR-119 board of BKNW-118 or DPR-150 board of BKNW-124.
In an encode block, the inputted the PB video signal is converted into the component signal data and the composite-encoded data, then output as the analog video output signals. In the 525/60 mode, setup processing is also carried out in the encode block.
These output data is converted from digital to analog and output from each VIDEO OUTPUT connector on the connector panel (CP-334 board) as an analog component signal and analog composite signal.
The analog composite output signal has three lines. Characters can be superimposed* on one (VIDEO OUTPUT COMPOSITE 3) of the lines.
The analog component output signal has only one line. No characters can be superimposed on the line.
In the encode block, the input PB video signal is also output to the SDI encode block on the SDI-41C board as the digital component signal so that it is used for the SDI output signal.
The digital component video signal for SDI output is multiplexed with 4-channel audio signals by the SDI encode block and converted from parallel to serial. The converted signal is then output from the SDI OUTPUT connectors on the connector panel as the SDI signal.
The SDI output signal has three lines. Characters can be superimposed* on one (SDI OUTPUT 3) of the lines.

*: The characters that are superimposed on the VIDEO OUTPUT COMPOSITE 3 and SDI OUTPUT 3 channels are the same.

Sync/video signal processing system

Reference internal signals for video and audio systems are produced on the VPR-47 board.
The inputted reference video signal from the REF VIDEO connector is sent to the timing generation block on the VPR-47 board.
In the timing generation block, sync and burst signals are separated and extracted from the inputttted reference video signal.
On the VPR-47 board, reference internal signals, timing signals (HD, VD, FRAME, CF, GOP, and AUDIO ID), and clocks (for video and audio) synchronized with this reference signal are produced based on the extracted sync signals. These signals and clocks are sent to each board.
The reference signal (SV REF) for a servo system is also produced by the timing generation block on the VPR-47 board and sent to the SS-83 board.

(2) Audio Signal Processing System (CP-278, CP-301, CP-335, APR-40C, AU-260, DPR-118, VR-223, and VR-224 Boards)

Betacam SX PB system

The PB audio data that was ECC-decoded by the outer ECC decode block on the DPR-118 board is input through a VAR ×2 process block to the DSP block for audio processing.
In the DSP block, five-field sequence processing (in 525/60 mode only) and JOG/VAR control are carried out. After that, the PB audio data is sent to the audio processing block on the APR-40C board as serial digital audio data.

Analog Betacam PB system

A longitudinal audio (CH1 and CH2) PB signal is sent to the AU-260 board and fed through the PB equalizer circuit and the PB amplifier to the Dolby C noise reduction block for Dolby noise reduction. After that, the PB signal is sent to the APR-40C board as CH1 and CH2 of an analog Betacam PB audio signal.
The C RF signal containing an AFM signal is sent from the DM-89 board to the AU-260 board. The C RF signal is passed through a low-pass filter to extract the AFM signal. After the AFM signal is converted from analog to digital, it is passed through the AFM TBC block and FM-demodulated by the AFM demodulation block. The AFM TBC block corrects a time base.
The demodulated audio signal is sent through the noise reduction block to the APR-40C board as CH3 and CH4 of the analog Betacam PB audio signal.

Output system

In the audio processing block on the APR-40C board, PB gain control, monitor output selection, and data delay control are performed. The four-line serial digital audio data for SDI output, line output (analog), line output (AES/EBU), and monitor output is output from this block.
The serial digital audio data for SDI output is sent to the SDI-41C board and converted into the SDI audio signal by the audio transmission TBC block. The converted data is then multiplexed with video data by an SDI encode block. The resultant data is converted from parallel to serial and output from the SDI OUTPUT connector on the connector panel as the SDI signal.
The serial digital audio data for line output (AES/EBU) is encoded to an AES/EBU format by an AES/EBU encode block and output from the AUDIO OUTPUT (AES/EBU) connector (CP-335 board) on the connector panel.
The audio signal data for line output (analog) and monitor output is oversampled by a digital filter and converted from digital to analog. The data is then de-emphasized and output from the connector panel (on the CP-278 and CP-301 boards).
After the audio signal data for monitor output is also de-emphasized, it is sent to the VR-223 board for headphone output. The data is level-controlled on the VR-223 board, and then output.

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(3) Digital Signal Processing System (DPR-118 board, DPR-119 board/BKNW-118, and DPR-150 board/BKNW-124)

Betacam SX PB data is sent from the EQ-75C board to the DPR-118C board and fed through the VAR ×2 process block (1/2) to the outer ECC decode block.
In the VAR ×2 process block (1/2), PB data is processed in the preceding stage during only VAR PB operation.
In the outer ECC decode block, outer error correction is performed for audio and video data after non-tracking processing (data rearrangement).
The video data after error correction is sent through the VAR ×2 process block (2/2) to the BRR (bit rate reduction) decode block. The audio data after error correction is sent through the VAR ×2 process block (2/2) to the DSP (digital signal process) block for audio processing.
In the VAR ×2 process block (2/2), the data processing (decimation) for VAR playback is performed for PB data in only the VAR PB mode.
In the BRR decode block, PB video data is SX-decoded to return to an eight-bit digital video signal. This signal is sent to the VPR-47 board as the Betacam SX PB video signal.
In the DSP block for audio processing, five-field sequence processing (in 525/60 mode only) and JOG/VAR control are performed.
The data output from the DSP block is sent to the audio processing block on the APR-40C board as serial digital audio data.

When SDTI (SX) output option BKNW-118 (DPR-119 board) is installed, the video data output from the outer ECC decode block and the audio data output from the VAR ×2 process block (2/2) are sent for feed PB output to the DPR-119 board.

When SDTI-CP output option BKNW-124 (DPR-150 board) is installed, the video data output from the outer ECC decode block and the audio data output from the VAR ×2 process block (2/2) are sent for feed PB output to the DPR-150 board, and the compressed video data output from the BRR Encode block and the audio data output from the audio process block (on the APR-40C board) are sent for the analog Betacam PB output to the same board.

(4) RF System (EQ-75C Board and Drum Assembly)

Playback system

The PB RF output signal of each PB head in the upper drum assembly is sent to each PB amplifier in the upper drum assembly. Only the PB amplifier output signal of the head that is enabled by a head control timing signal is sent to the EQ-75C board through the rotary transformer.
For the analog Betacam PB operation, RF signals (Y-A, Y-B, C-A, and C-B) are sent to the EQ-75C board and sent through the equalize block to the DM-89 board.
For the Betacam SX PB operation, a maximum of four-line RF signals are sent to the EQ-75C board. These RF signals are passed through the amplifier and equalization circuit in the equalize block and converted from analog to digital. The converted signals are then sent to the inner ECC decode block as PB data. In the inner ECC decode block, viterbi decoding and inner error correction are performed.
The PB data after error correction is sent to the DPR-118 board.

Control system

The control signal of each PB head in the drum assembly is encoded to MPX data by the MPX encoder on the EQ-75C board and sent through the rotary transformer to the upper drum assembly. The MPX data is decoded to a head control timing signal by the MPX decoder in the upper drum assembly. Each head is controlled by the head control timing signal.

(5) Analog Betacam PB Video System (DM-89, TBC-23A, and TBC-24 Boards)

The RF signals (Y and C) sent from the equalize block on the EQ-75C board are passed through the COS equalization circuit for FM demodulation. The demodulated signals are passed through the nonlinear de-emphasis processing circuit and noise canceller circuit, and the signals are sent to the TBC-24 board. Additionally, the DM-89 board detects a drop out. C RF signal contains the analog Betacam PB audio signal and the AFM signal for CH3 and CH4. The AFM signal is sent from the DM-89 board to the AU-260 board. The FM-demodulated video signal on the DM-89 board is converted from analog to digital on the TBC-24 board and delay-processed for timing adjustment. The resultant signal is sent to the TBC-23A board. On the TBC-24 board, a sync signal is extracted from a video signal, and memory (TBC-23A board) control clocks and timing pulses are generated based on the sync signal. The TBC-24 board also corrects an impact error. By the video data processing block and line memory, the video signal data sent to the TBC-23A board performs time-base correction, search picture processing, and CTDM expansion according to each timing pulse generated on the TBC-24 board.
The Y and C (R-Y/B-Y) signal data read from the line memory is dropout-compensated by the DOC block and noise-reduced by an ENR block. Moreover, the R-Y/B-Y signal data is LCC (line crawl cancel)-processed and sent to the MPX block.
The Y, R-Y, and B-Y signals input to the MPX block are converted into a D1 format. The converted signals are then passed through a setup remove block and sent to the VPR-47 board as an analog Betacam PB video signal. In the setup remove block, setup level is removed for an NTSC system (525/60 mode) only.

(6) System Control System and Servo System (SS-83 Board)

System control and servo control are performed on the SS-83 board. Two main CPUs (SYS1 CPU and SYS2 CPU) for system control and one main CPU (servo CPU) for servo control are mounted on the SS-83 board. Moreover, drum MPU and DT MPU are mounted on the SS-83 board.

System control

SYS1 CPU uses RISC CPU, and the operating clock is 40 MHz.
SYS1 CPU performs the following processing.

- Remote interface processing
  (REMOTE1-IN/OUT (9-pin), PARALLEL I/O (50-pin), RS-232C, and VIDEO CONTROL connectors)
- Processes communications with KY MPU on KY-438 board.
  (for JOG/Search dial I/F and Lower control panel I/F)
- Processes communications with FP MPU on FP-117 board.
  (for Sub control panel I/F and Upper control panel I/F)
- Processes communications with SYS2 CPU.
- Controls character superimposition.

Like SYS1 CPU, SYS2 CPU also uses RISC CPU. The operating clock is 40 MHz.
SYS2 CPU performs the following processing.

- Controls LSIs, DSP, and PIOs on VPR-47, APR-40C, SDI-41C, DPR-118, and DPR-119 (BKNW-118) boards.
- Processes communications with MPUs on EQ-75C, SDI-41C, DM-89, and TBC-23A boards.
- Controls the fluorescent (FL) indicator (audio level meter).
- Processes communications with SYS1 CPU.
- Processes communications with servo CPU.
- Time code (TC) processing.
- Processes communications with SYS3 CPU on DPR-150 (BKNW-124) board.

Servo control

Servo CPU uses 16-bit CPU. The operating clock is 20 MHz.
Servo CPU performs the following processing.

- Controls various motor drivers (capstan, reels, and drum).
- Detects each FG signal, PG signal, and sensor state.
- Generates each mode signal and timing pulse corresponding to the tape transport state.
- Controls the addresses of each JOG memory on the VPR-47 board and the DPR-118 board.
- Processes communications with drum MPU (head select control MPU).
- Processes communications with DT MPU (bimorph (DT) heads control MPU for analog Betacam PB operation).

Each communication between SYS1 CPU and SYS2 CPU, SYS2 CPU and servo CPU, and servo CPU and DT MPU is performed via the dual port RAM.

(7) SDTI (SX) Output System (Option) (DPR-119 Board)

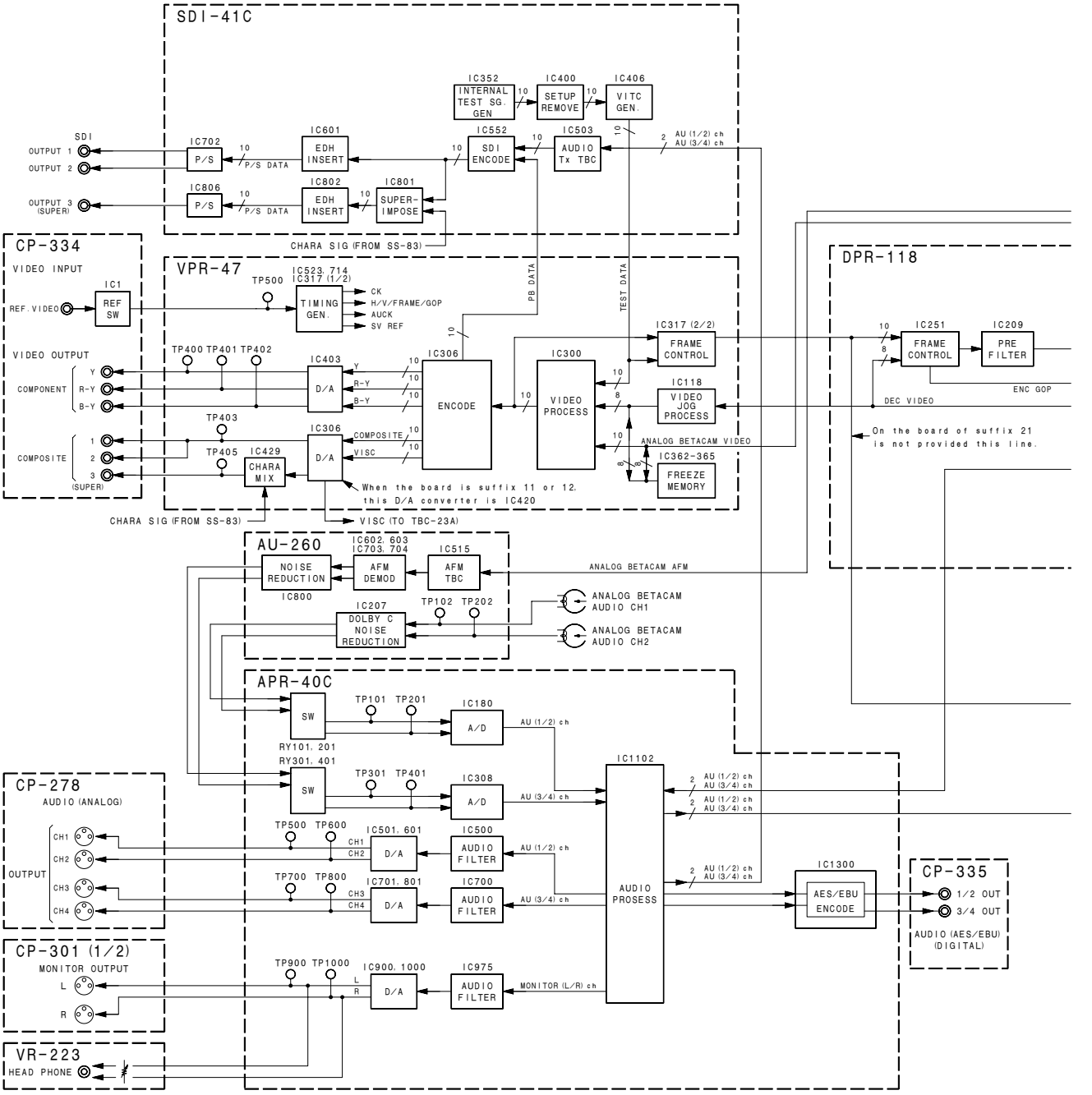
SDTI (SX) output processing is performed on the DPR-119 board (BKNW-118).
The video signal data and audio signal data that are output from the DPR-118 board as SDTI output signal data are packed by the video and audio data pack blocks on the DPR-119 board.
The packed signal data is passed through an SDTI (SX) interface block and converted from parallel to serial. The converted signal data is then output from the connector panel as the SDTI (SX) output signal.

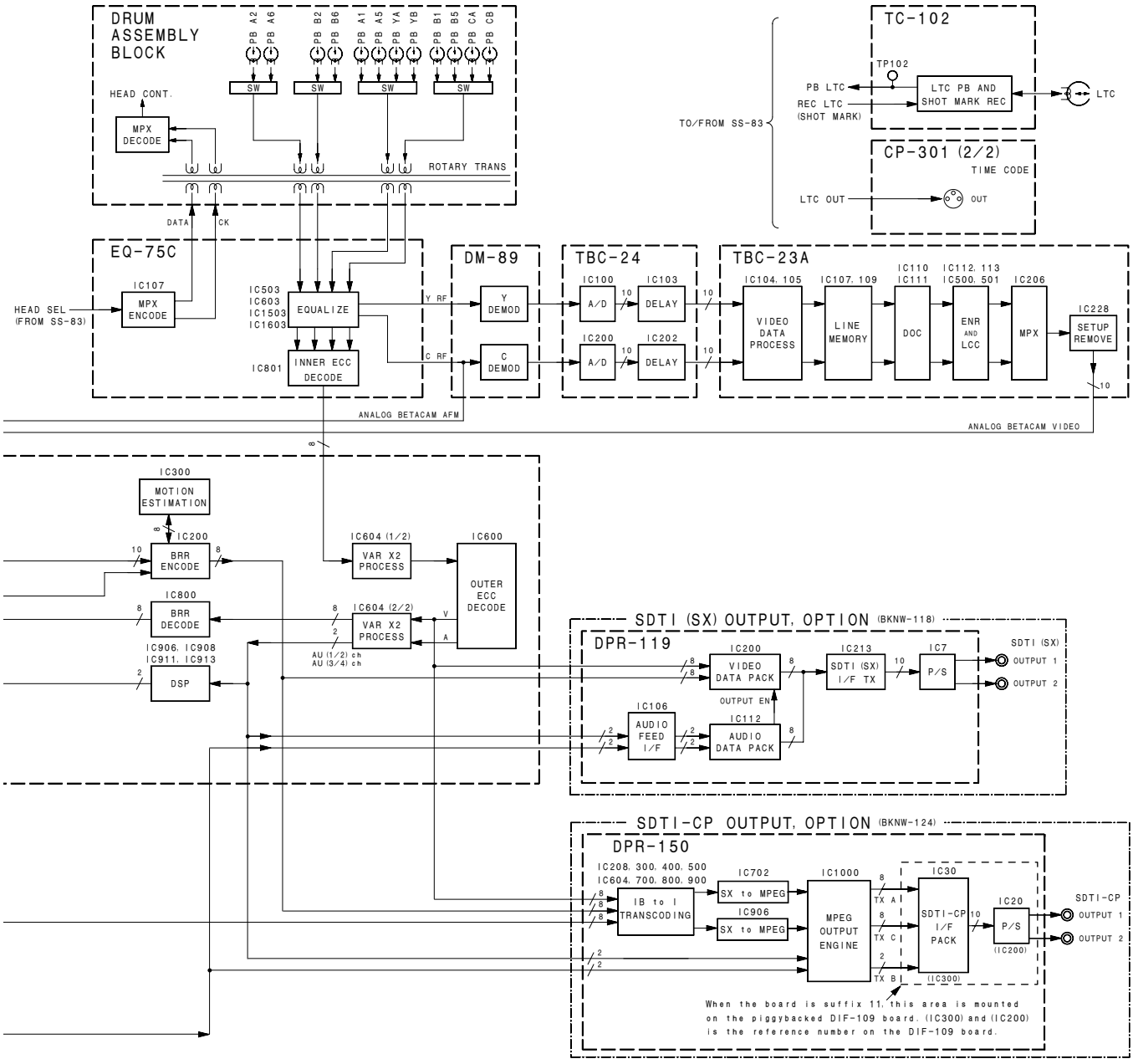
(8) SDTI-CP Output System (Option) (DPR-150 Board/BKNW-124)

SDTI-CP output processing is performed on the DPR-150 board (BKNW-124).

The video signal data output from the DPR-118 board as SDTI-CP output signal data is performed a transformation coding (transforms a IB stream into an I only stream) by the transcode block. The video signal data is converted to MPEG stream by SX-to-MPEG block. The converted video signal data is send to the SDTI-CP pack block.
The audio signal data is send to the SDTI-CP pack block through the audio I/F block.
The video signal data and audio signal data input to the SDTI-CP pack block are packed to the SDTI-CP format. The packed signal data is then output from the connector panel as the SDTI-CP output signal after converting from parallel to serial.

On the DPR-150 board, SYS3 CPU is mounted for controlling.
SYS3 CPU used RISC CPU, and the operating clock is 40 MHz.
Communication between SYS3 CPU and SYS2 CPU (SS-83 board) is performed via the dual port RAM.

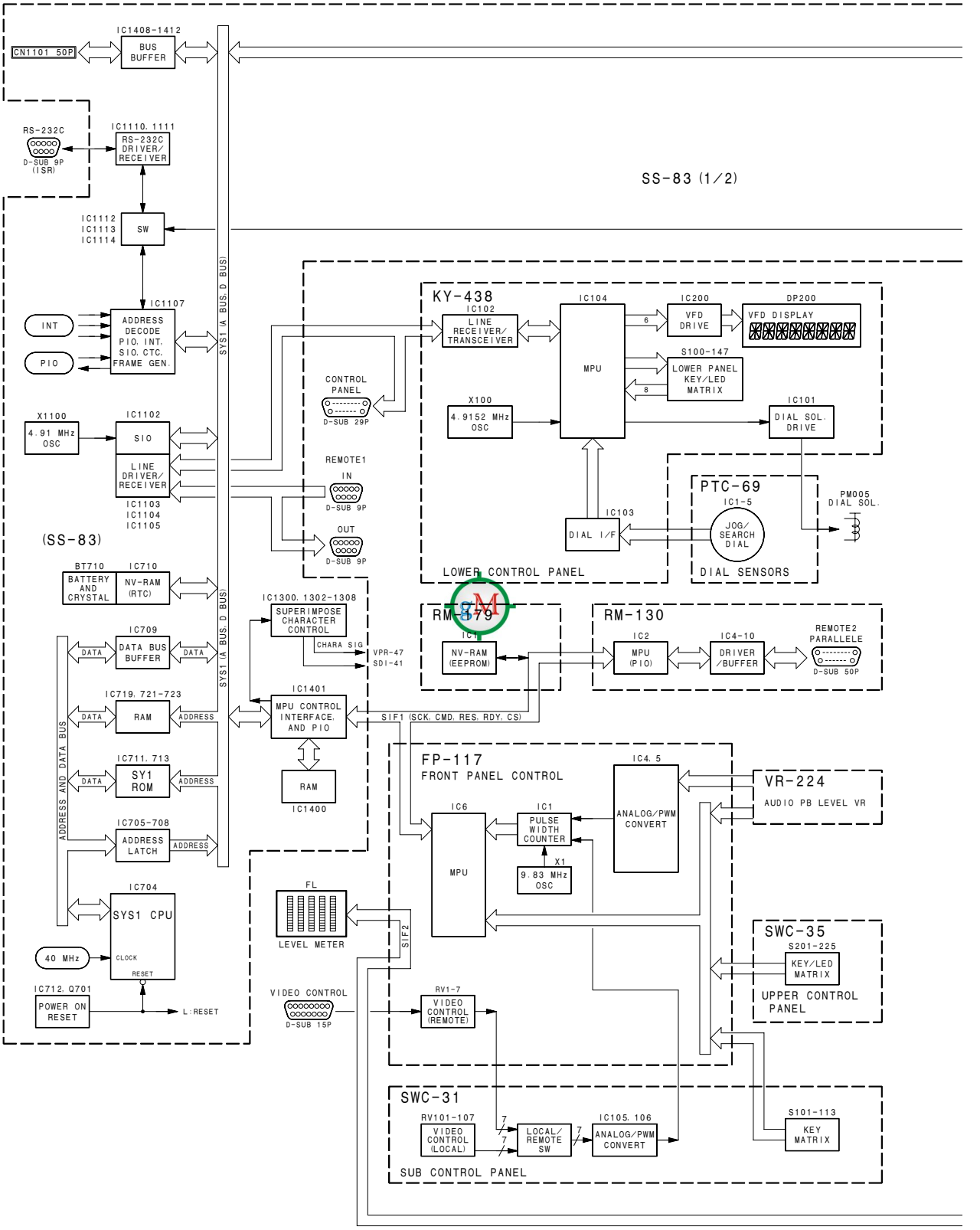

SDI-41C
IC352
INTERNAL TEST SG. GEN
IC400
SETUP REMOVE
IC406
VITC GEN.
SDI
OUTPUT 1
OUTPUT 2
OUTPUT 3 (SUPER)
IC702
P/S
P/S DATA
IC601
EDH INSERT
IC552
SDI ENCODE
IC503
AUDIO Tx TBC
AU (1/2) ch
AU (3/4) ch
IC806
P/S
IC802
EDH INSERT
IC801
SUPER-IMPOSE
CHARA SIG (FROM SS-83)
CP-334
VIDEO INPUT
REF. VIDEO
IC1
REF SW
VIDEO OUTPUT
COMPONENT
Y
R-Y
B-Y
COMPOSITE
1
2
3
(SUPER)
VPR-47
TP500
IC523, 714
IC317 (1/2)
TIMING GEN.
CK
H/V/FRAME/GOP
AUCK
SV REF
PB DATA
TEST DATA
TP400 TP401 TP402
IC403
D/A
IC306
ENCODE
IC300
VIDEO PROCESS
IC317 (2/2)
FRAME CONTROL
IC118
VIDEO JOG PROCESS
ANALOG BETACAM VIDEO
IC362-365
FREEZE MEMORY
TP403
TP405
IC429
CHARA MIX
IC306
D/A
COMPOSITE
VISC
When the board is suffix 11 or 12, this D/A converter is IC420
CHARA SIG (FROM SS-83)
VISC (TO TBC-23A)
DPR-118
IC251
FRAME CONTROL
IC209
PRE FILTER
ENC GOP
DEC VIDEO
On the board of suffix 21 is not provided this line.
AU-260
IC602, 603
IC703, 704
NOISE REDUCTION
IC800
AFM DEMOD
IC515
AFM TBC
ANALOG BETACAM AFM
IC207
DOLBY C NOISE REDUCTION
TP102 TP202
ANALOG BETACAM AUDIO CH1
ANALOG BETACAM AUDIO CH2
APR-40C
SW
RY101, 201
TP101 TP201
IC180
A/D
AU (1/2) ch
RY301, 401
TP301 TP401
IC308
A/D
AU (3/4) ch
IC1102
AUDIO PROSESS
CP-278
AUDIO (ANALOG)
OUTPUT
CH1
CH2
CH3
CH4
TP500 TP600
IC501, 601
D/A
IC500
AUDIO FILTER
TP700 TP800
IC701, 801
D/A
IC700
AUDIO FILTER
IC1300
AES/EBU ENCODE
CP-335
1/2 OUT
3/4 OUT
AUDIO (AES/EBU) (DIGITAL)
CP-301 (1/2)
MONITOR OUTPUT
L
R
TP900 TP1000
IC900, 1000
D/A
IC975
AUDIO FILTER
MONITOR (L/R) ch
VR-223
HEAD PHONE



SIGNAL PROCESSING SYSTEM

OVERALL (1/3)

DNW-A65/A65P


SS-83 (1/2)
(SS-83)
IC1408-1412
BUS BUFFER
CN1101 50P
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REMOTE1
IN
OUT
D-SUB 9P
KY-438
IC102
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IC104
MPU
IC200
VFD DRIVE
DP200
VFD DISPLAY
S100-147
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4.9152 MHz OSC
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IC103
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PTC-69
IC1-5
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DIAL SENSORS
PM005
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ADDRESS AND DATA BUS
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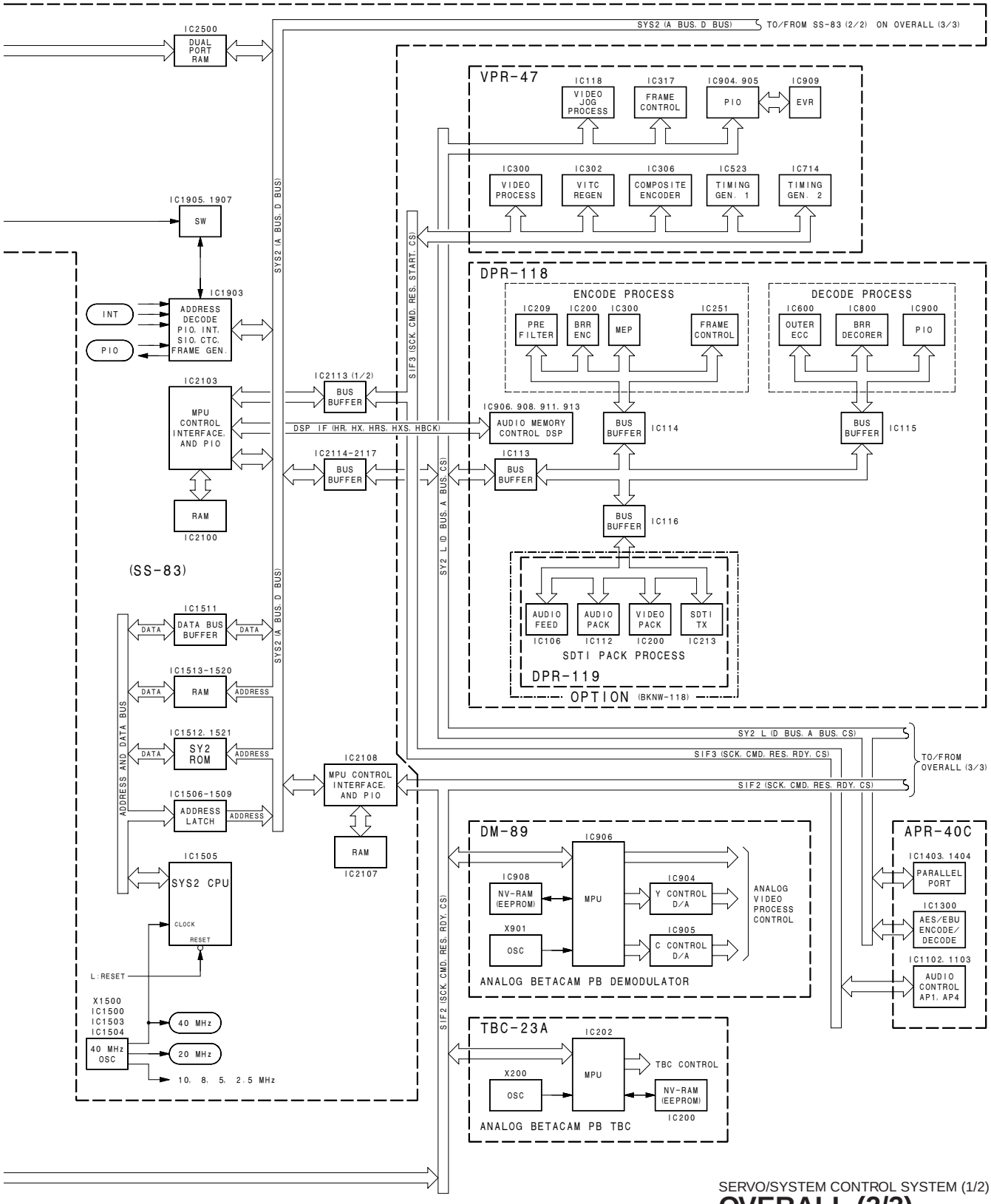
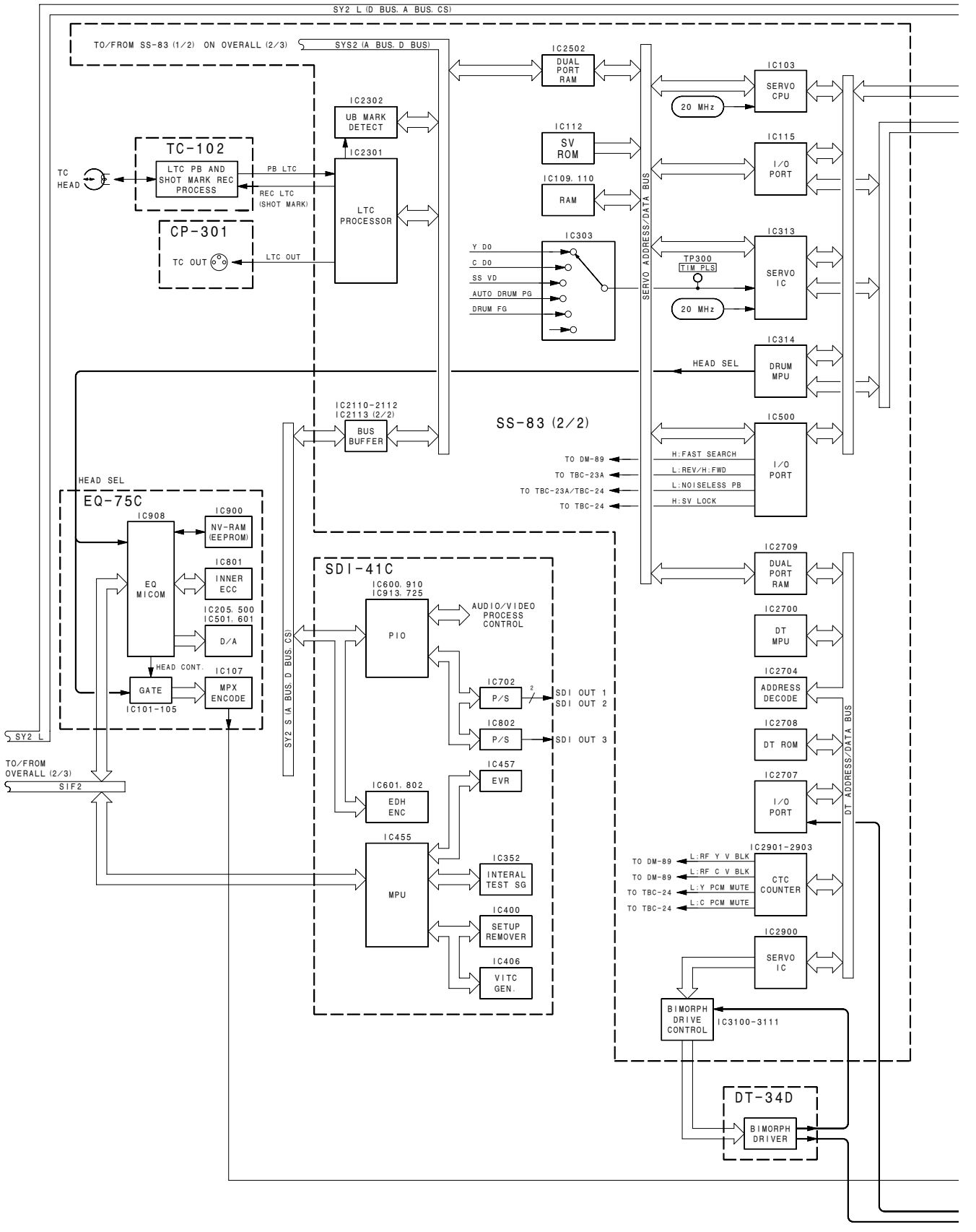


SERVO/SYSTEM CONTROL SYSTEM (1/2)

OVERALL (2/3)

DNW-A65/A65P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L:RF C V BLK
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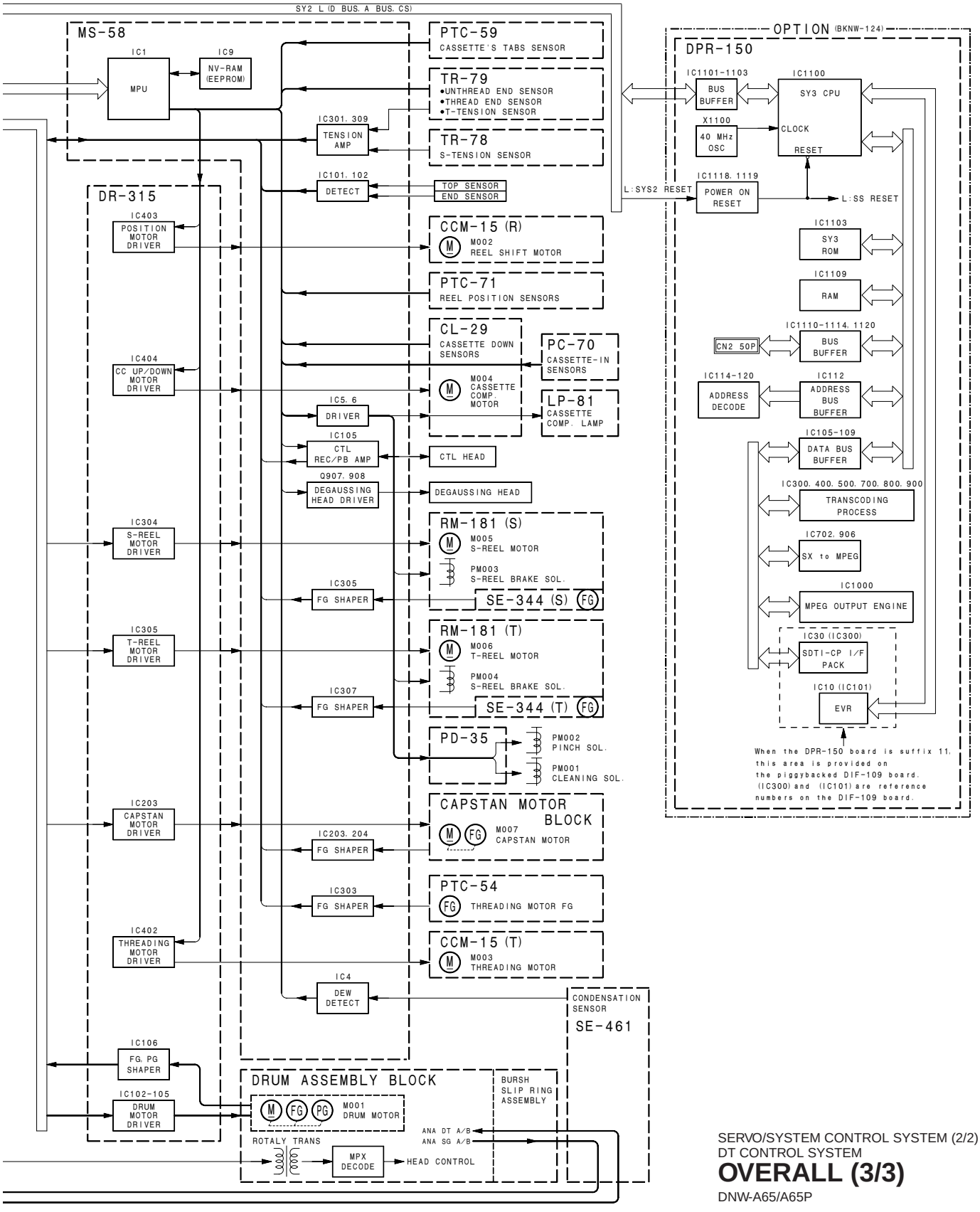
DT-34D
BIMORPH DRIVER



SERVO/SYSTEM CONTROL SYSTEM (2/2)
DT CONTROL SYSTEM

OVERALL (3/3)

DNW-A65/A65P

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For the U.S.A. and Canada

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

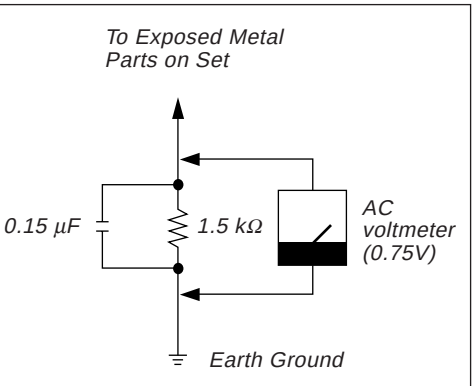

Fig A. Using an AC voltmeter to check AC leakage.

DNW-A65 (SY)
DNW-A65P (SY) E
3-201-266-02

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SONY

DIGITAL VIDEOCASSETTE PLAYER

DNW-A65/A65P

BETACAM SX

MAINTENANCE MANUAL Part 2

Volume 1 1st Edition

Serial No. 10001 and Higher: DNW-A65

Serial No. 40001 and Higher: DNW-A65P

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

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Manual Structure

Purpose of this manual

This manual is the Maintenance manual part 2 volume 1 of digital videocassette player DNW-A65/A65P.

This Maintenance manual part 2 is intended for use by trained system and service engineers, and provides the information that premises the parts level service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

This manual (volume 1) explains about parts replacement and guideline for adjustment.

Contents

This Maintenance manual part 2 (volume 1, volume 2, and volume 3) is organized by following sections.

Maintenance manual part 2 volume 1 (9-967-811-)

Section 1 Service Overview

Explains the information of circuit protection devices, NV-RAMs, alignment tapes, extension boards, the removal of PLCC IC, and the service actions after replacing/repairing the mounted circuit boards.

Section 2 Electrical Alignment

Explains the electrical alignment for the maintenance of this unit.

Section 3 Replacement of Main Parts

Explains the replacement of mechanical parts, power supply unit, and circuit boards.

Section 4 Tape Path Alignment

Explains the tape path alignment after replacement of parts that are described in Section 3.

Section 5 Electrical Alignment after Main Parts Replacement

Explains the electrical alignment associated with replacement of parts that are described in Section 3.

Maintenance manual part 2 volume 2 (9-967-812-)

Section 1 Service Overview
Describes the notes on repair parts.

Section 2 Exploded Views
Describes the exploded views and the mechanical parts list (including some electrical parts) .

Section 3 Electrical Parts List
Describes the electrical parts list of each board (including some mechanical parts) . Moreover, describes the electrical parts list (frame electrical parts list) except on the board.

Section 4 Packing Materials and Supplied Accessories List
Describes the packing materials and the supplied accessories list.

Section 5 Power Cords List
Describes the recommended power cords list.

Section 6 Optional Fixtures List
Describes the optional fixtures and maintenance articles list.

Maintenance manual part 2 volume 3 (9-967-813-)

Section 1 Semiconductor Pin Assignments
Describes the semiconductor pin assignments.

Section 2 Block Diagrams
Describes the block diagrams of overall and each board.

Section 3 Schematic Diagrams and Frame Wiring
Describes the frame wiring and the schematic diagrams for the unit.

Section 4 Board Layouts
Describes the board layouts for the unit.

Related manuals

Besides this “Maintenance manual part 2”, the following manuals are available for digital videocassette player DNW-A65/A65P.

- **Operation Manual (Supplied with the DNW-A65/A65P.)**
  This manual is necessary for application and operation (and installation) of the DNW-A65/A65P.

- **Maintenance Manual Part 1 (Supplied with the DNW-A65/A65P.)**
  This manual describes the information that is required to install, maintenance information, and the information for service such as replacement of plug-in boards.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact your local Sony Sales Office/Service Center.

- **Interface Manual of Parallel I/O (50-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the parallel (50-pin). If this manual is required, please contact your local Sony Sales Office/ Service Center.

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Section 1
Service Overview

1-1. Circuit Protection Device (Fuse)

Fuses for circuit protection are mounted on the boards of the VTR.
A fuse will melt and break when abnormality occurs and an over-current flows (or over-heat occurs) in the equipment. Be sure to replace it with the specified fuse as shown below after tracing and removing the root of the melt-breaking.

CAUTION

Use the specified part only

The fuse is critical parts to safe operation. Replace these components with Sony parts whose part numbers appear in this manual published by Sony. If not, this may cause a fire or electric shock. Be sure to use the specified component in this manual

Board name	Ref. No. (address)	Description	Part No.
APR-40 board	PS1200 (F-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
DPR-118 board	PS11 (G-7) PS12 (G-7) PS13 (H-7) PS15 (E-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
DR-315 board	PS1 (A-5)	Fuse (chip) 5 A, 125 V	⚠ 1-533-275-21
DT-34D board	F1	H. B. C. fuse 1 A, 250 V	⚠ 1-576-225-11
EQ-75 board	PS1 (G-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
SDI-41 board	PS900 (F-7)	Fuse (chip) 4 A, 125 V	⚠ 1-533-272-11
SS-83 board	PS100 (E-7)	Fuse (chip) 3.15 A, 125 V	⚠ 1-533-266-11
	PS101 (E-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
TBC-23A board	PS1 (C-7)	Fuse (chip) 0.5 A, 125 V	⚠ 1-533-271-21
TC-102 board	PS200 (D-1) PS300 (D-1)	Fuse (chip) 0.4 A, 125 V	⚠ 1-533-724-11
VPR-47 board	PS900 (E-7)	Fuse (chip) 5 A, 125 V	⚠ 1-533-275-21

Note: (address) means the mounted address of fuse.

1-2. Memory IC with Backup Battery

Memory IC (RAM, IC710) with backup battery is used on the SS-83 board.
This IC is used to store the setting data of setup menu, etc. Besides it has an RTC (Real Time Clock) function, which is also used in the VTR.
Owing to this battery, even if the external power is cut off, this IC can maintain the stored data and the RTC continues operating.
However, if the battery life comes to end with the external power was cut off, memory can not maintain the stored data and the RTC is failing to function.

Backup battery

Use the following specified parts when replacing.
Replacement way is described in Section 2-16 of the maintenance manual Part 1.
Replacement part : BT710 / SS-83 board
Name : M4T28-BR12SH1 (lithium battery)
Part No. : 1-767-156-11
Recommended time of replacemant :
Every seven years

Replacement time

When life-ending the battery while the VTR is powered off, the RTC is failing to function.
If powered on in such a condition, the error code 96, sub error message “CALENDAR CLOCK” will be displayed. This message is displayed, be sure to replace the backup battery.

Note

- This sub error message is displayed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 (SUPER) connector with the CHARACTER switch turned on.
  Other sub error messages, if present, are also displayed together.
- When the error code 96, sub error message “CALENDAR CLOCK” is displayed, the date in the calendar will be reset to 1/Nov. 1996.
  You can check the date in calendar/clock using the error logger display mode (M2 : ERROR LOGGER) in the maintenance mode.

Note

When the backup battery is replaced, perform the same setting change as IC710 on the SS-83 board is replaced. Refer to “1-3. NV-RAM” for details.

1-3. NV-RAM

There are the NV-RAMs (EEP-ROM, and RAM with backup battery) and EVR ICs used on the boards in the VTR. These devices store the adjustment data, various setting data for the VTR, data for the hours meters and error log respectively, etc.

EEP-ROM: Electric Erasable P-ROM
EVR: Electric Variable Resister (D/A converter with EEP-ROM)

After replacing above-mentioned device, take the following service actions.
“Service action after replacing” and “Stored data” are listed on next page.
IC710 on the SS-83 board is the only NV-RAM with backup battery.

Note

After replacing the NV-RAM, the error (error code 95, 96, 97, or 98) will occur at power-on.

After replacing IC1/RM-179:	Occurs Error code 95.
After replacing IC710/SS-83:	Occurs Error code 96.
After replacing IC9/MS-58:	Occurs Error code 97.
After replacing IC908/DM-89:	Occurs Error code 98.
After replacing IC900/EQ-75:	Occurs Error code 98.
After replacing IC200/TBC-23A:	Occurs Error code 98.

When replacing IC710 on the SS-83 board and IC1 on the RM-179 board, the error will not occur at the second power-on and later.

Board / Ref.No.	Type	Stored data	Service action after replacing
DM-89 / IC908	NV-RAM	Adjustment data for DM-89 board	Readjust the DM-89 board (Analog Betacam PB system). (Perform Sections 2-11-2 to 2-11-19.)
EQ-75 / IC900	NV-RAM	Adjustment data for EQ-75 board	Readjust the EQ-75 board (RF system). (Perform Section 2-6.)
MS-58 / IC9	NV-RAM	Adjustment data for servo system	After the initialization, readjust the servo system. (Refer to Section 2-5.)
		Hours meter data	None (All data are lost and automatically initialized to count zero.)
		Serial No.	Set by the menu M31 of the maintenance mode.
		Head room of the audio level meter	Set by the menu M37 of the maintenance mode. (When setting it to except 20 dB.)
		Setting data of ISR	Reset by the menu M39 of the maintenance mode.
RM-179/IC2	NV-RAM	Setting data of 50-pin remote	Reset by the menu M32 of the maintenance mode.
SDI-41 / IC457	EVR IC	Adjustment data for SDI-41 board	Readjust the SDI-41 board (SDI output system). (Perform Section 2-11.) When the optional board is installed, also readjust the SDTI output system. (Perform Section 2-11.)
SS-83 / IC710	NV-RAM	Setting data of setup menu	Set the setup menu again.
		Error logs data	None (All data are lost.)
		ID code data	Set by the ISR (Interactive Status Reporting) application software.
		Calendar/clock	Set the calendar and clock again. (Refer to “4-3. Error Logger display mode” of the maintenance manual Part 1.)
TBC-23A / IC200	NV-RAM	Adjustment data for TBC-23A board	Readjust the TBC-23A board (Analog Betacame PB system). (Perform Sections 2-11-2, 3, 24, 25 and 28.)
VPR-47 / IC909	EVR IC	Adjustment data for VPR-47 board	Readjust the VPR-47 board (Video system). (Perform Section 2-8.)

Refer to Section 4 of the maintenance manual Part 1 for the menu of the maintenance mode.

1-4. PLCC IC Removal

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.

Tool required

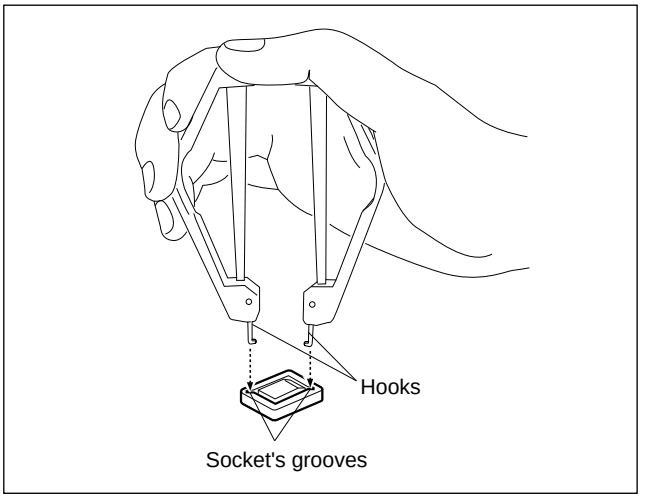
Description: IC extraction tool for PLCC socket
SONY Part No. J-6035-070-A
This tool can be used for IC whose pins number are 20 to 124.

Procedure

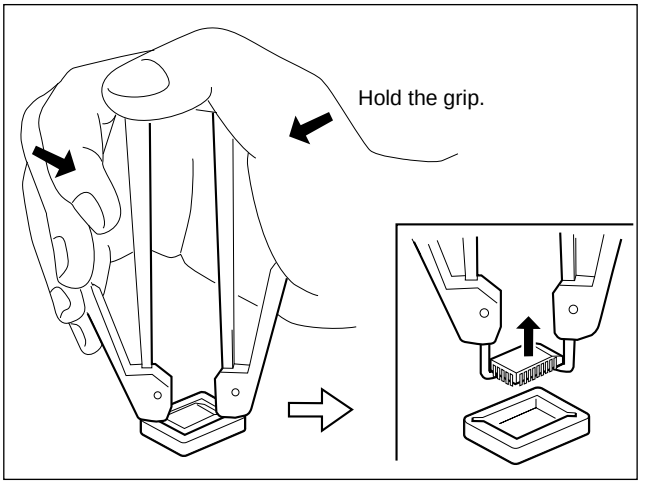
Notes

- Do not pull the IC upward using a hook of the extraction tool.
- Do not interpose the tool by excessive force.

1. Fit the tool's hooks in the grooves of IC socket.



2. Hold the grip as shown in the figure.
   Then holds IC with hooks, and removes it from the socket.
3. Lift up the tool softly with IC nipping.



1-5. Alignment Tape

Describes the alignment tapes used for adjusting the unit.

1. SR5-1 (SONY part No. 8-960-075-01): For 525/60 system
SR5-1P (SONY part No. 8-960-075-51): For 625/50 system

Used for video/audio adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
2:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100 % color-bar	–∞ dB FS	CTL
6:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
8:00 -	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, –20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	–∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, –20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, –20 dB FS	CTL
20:00 -	100 % color-bar	1 kHz sine wave, –20 dB FS	CTL
22:00 -	100 % color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100 % color-bar	–∞ dB FS	CTL
26:00 -	100 % color-bar	20 Hz sine wave, –20 dB FS	CTL
28:00 - 30:00	100 % color-bar	20 kHz sine wave, –20 dB FS	CTL

2. SR2-1 (SONY part No. 8-960-075-11) :For 525/60 system
SR2-1P (SONY part No. 8-960-075-61) :For 625/50 system

Used for servo adjustment.

Time (min. : sec.)	Digital video	Digital audio	CTL track
00:00-	3.212 MHz (A CH only)	SR2-1: 3 kHz, 0 VU	CTL
(Pulse*)		SR2-1P: 3.15 kHz, 0 VU	
15:00 -	A CH : 3.212 MHz	SR2-1: 3 kHz, 0 VU	CTL
	B CH : 6.424 MHz	SR2-1P: 3.15 kHz, 0 VU	
20:00 -	12.848 MHz (All CH)	SR2-1: 3 kHz, 0 VU	CTL
		SR2-1P: 3.15 kHz, 0 VU	
25:00 - 27:00	100 % color-bar (All CH)	No signal	CTL

*: The time code data is not recorded on the time code track during pulse portion (00:00 to 15:00). This portion is recorded the duty 7:3 pulse on the CTL track. Therefore, when playing back this portion, time data which is interpolated by the time code signal is displayed.

3. CR2-1B (SONY part No. 8-960-096-01) : For analog Betacam, NTSC
CR2-1B PS (SONY part No. 8-960-096-51) : For analog Betacam, PAL

Used for tracking adjustment.

Time (min. : sec.)	Video Track	AFM	LAU track	CTL track
00:00 -28:00 (Pulse*)	Y : 4 MHz C : 5 MHz	No signal	No signal	CTL

*: The time code data is not recorded on the time code track of this tape. But the duty 7:3 pulse is recorded on the time code track. Therefore, when playing back this tape, time data which is interpolated by the CTL signal is displayed.

4. CR5-1B (SONY part No. 8-960-096-41): For analog Betacam, NTSC
CR5-1B PS (SONY part No. 8-960-096-91): For analog Betacam, PAL

Used for Betacam video/audio adjustment.

Time (min. : sec.)	Video	AFM	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60 % H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60 % multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75 % color-bar CR5-1B PS: 100 % color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50 % bowtie & 12.5T CR5-1B PS: 50 % bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75 % color-bar with Drop-out CR5-1B PS: 100 % color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

5. CR5-2A (SONY part No. 8-960-097-44): For analog Betacam, NTSC
CR5-2A PS (SONY part No. 8-960-098-44): For analog Betacam, PAL

Used for Betacam video adjustment.

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75 % color-bar	No signal	CTL
3:00 -	60 % multi-burst	No signal	CTL
6:00 -	CR5-2A: 50 % bowtie & 12.5T CR5-2A PS: 50 % bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

6. CR8-1A (SONY part No. 8-960-097-45): For analog Betacam, NTSC
CR8-1A PS (SONY part No. 8-960-098-45): For analog Betacam, PAL

Used for Betacam audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, –10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0 VU	No signal

7. CR8-1B PS (SONY part No. 8-960-096-86): For analog Betacam, PAL

Used for Betacam audio adjustment.

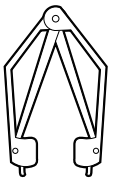
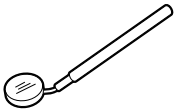
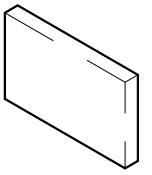
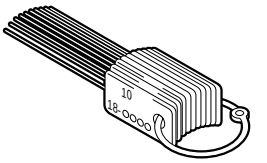
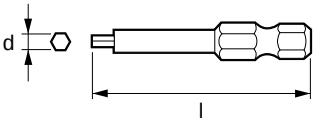
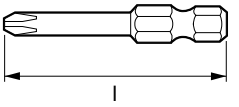
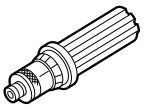
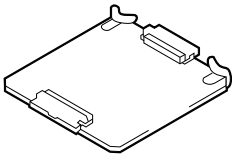
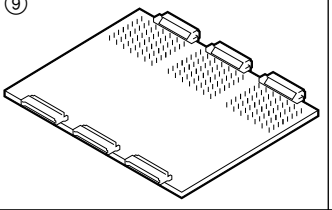
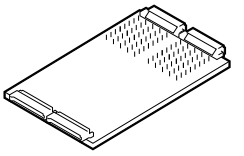
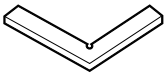
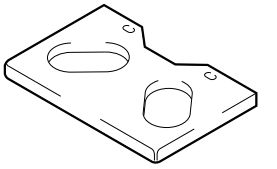
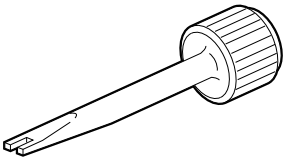
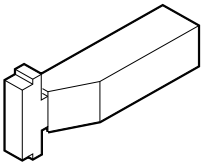
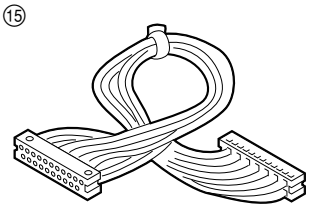
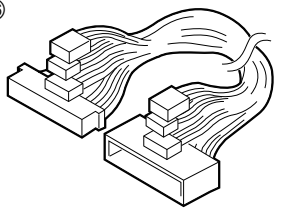
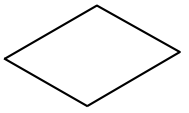
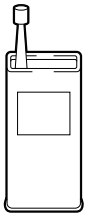
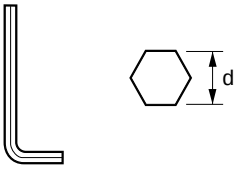
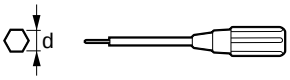
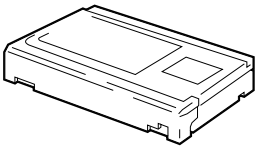
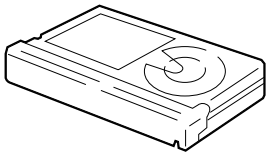
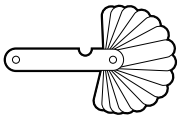
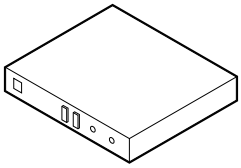
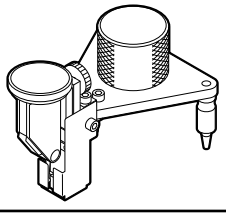
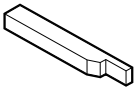
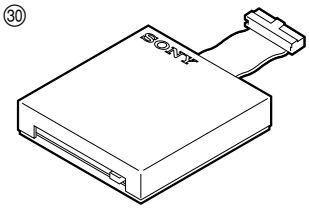
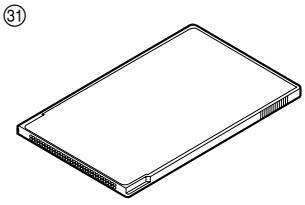
Time (min. : sec.)	LAU tracks	CTL track	Video	AFM
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal	No signal
2:55 -	No signal	CTL	No signal	No signal
3:00 -	15 kHz sine wave, 0 VU	CTL	No signal	No signal
4:55 -	No signal	CTL	No signal	No signal
5:00 -	1 kHz sine wave, –20 VU	CTL	No signal	No signal
5:55 -	No signal	CTL	No signal	No signal
6:00 -	40 Hz sine wave, –20 VU	CTL	No signal	No signal
6:25 -	No signal	CTL	No signal	No signal
6:30 -	7 kHz sine wave, –20 VU	CTL	No signal	No signal
6:55 -	No signal	CTL	No signal	No signal
7:00 -	10 kHz sine wave, –20 VU	CTL	No signal	No signal
7:25 -	No signal	CTL	No signal	No signal
7:30 -	15 kHz sine wave, –20 VU	CTL	No signal	No signal
7:55 - 8:00	No signal	CTL	No signal	No signal

1-6. Fixtures and Adjustment Equipment List

1-6-1. Fixtures

Note
The tools that are used only in the maintenance manual part 1 are also described.

Fig. No.	Part No.	Description	[Inscription No.]	For use
①	J-6035-070-A	Extraction tool (for PLCC socket)	—	Extraction of IC (PLCC type)
②	J-6080-029-A	Small dental mirror (round type ø12)	—	Cassette pillar height adjustment, tape path adjustment
③	J-6086-570-A	Reference flat plate	[SL-657]	AT head zenith adjustment
④	J-6152-450-A	Wire clearance check gauge set	—	Clearance check
⑤	J-6251-090-A	Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm)	—	Tightening screws to fix a drum assembly and upper drum asssembly
	J-6323-440-A	Torque screwdriver's hexagonal bit (d=0.89 mm, l=50 mm)	—	Tightening screws to fix a M gear
⑥	J-6323-420-A	Torque screwdriver's bit (+2 mm, l=75 mm)	—	Tightening screws to fix a brush/slip ring assembly
	J-6323-430-A	Torque screwdriver's bit (+3 mm, l=90 mm)	—	Tightening screws to fix a reel motor assembly or a ring roller
⑦	J-6252-510-A	Torque screwdriver (6 kg•cm)(0.6 N•m)	[JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kg•cm)(1.2 N•m)	[JB-5252]	Tightening screws
⑧	J-6269-810-A	Extension board (S), EX-377	—	Extension of the small-sized plug-in board (DM, TBC)
⑨	A-8277-211-A	Extension board (L), EX-555	—	Extension of the large-sized plug-in board
⑩	A-8277-212-A	Extension board (S), EX-556	—	Extension of the small-sized plug-in board (EQ, AU, SDI)
⑪	J-6320-870-A	Reel motor shaft slantness check fixture	[MW-087]	Reel motor shaft slantness adjustment
⑫	J-6320-880-A	Cassette reference plate (L)	[MW-088]	Reel table height adjustment, Reel motor shaft slantness adjustment
⑬	J-6322-610-A	Tape guide adjustment driver	[MW-261]	Tape path alignment
⑭	J-6329-350-A	Reel table height gauge	[MW-935]	Reel table height adjustment
⑮	1-952-684-11	Extension cable (14P)	—	Extension of the TBC-23A or TBC-24 board
⑯	A-8321-333-A	Power cable assembly (For power supply unit)	—	Extension of the power supply unit
⑰	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	—	Cleaning
⑱	7-432-114-11	Locking compound (200 g)	—	Inhibits loosening of screws
⑲	7-661-018-18	Diamond oil NT-68 (50 ml)	—	
⑳	7-651-000-10	Sony grease SGL-601 (50 g)	—	
㉑	7-700-736-01	L-shaped hexagonal wrench (d=1.27 mm)	—	
	7-700-736-04	L-shaped hexagonal wrench (d=2.5 mm)	—	
	7-700-736-05	L-shaped hexagonal wrench (d=1.5 mm)	—	
	7-700-736-06	L-shaped hexagonal wrench (d=0.89 mm)	—	
㉒	7-700-766-04	Hexagonal wrench driver (d=2.5 mm)	—	
㉓	8-960-075-01	Alignment tape, SR5-1	—	Video/audio alignments (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	—	Servo alignments (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	—	Video/audio alignments (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	—	Servo alignments (for 625/50 system)
㉔	8-960-096-01	Alignment tape, CR2-1B	—	Tracking adjustment (for analog Betacam NTSC)
	8-960-096-41	Alignment tape, CR5-1B (metal particle tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-096-51	Alignment tape, CR2-1B PS	—	Tracking adjustment (for analog Betacam PAL)
	8-960-097-44	Alignment tape, CR5-2A (oxide tape)	—	Video alignments (for analog Betacam NTSC)
	8-960-097-45	Alignment tape, CR8-1A (oxide tape)	—	Audio alignments (for analog Betacam NTSC)
	8-960-096-91	Alignment tape, CR5-1B PS (metal particle tape)	—	Video alignments (for analog Betacam PAL)
	8-960-096-86	Alignment tape, CR8-1B PS (metal particle tape)	—	Audio alignments (for analog Betacam PAL)
	8-960-098-44	Alignment tape, CR5-2A PS (oxide tape)	—	Video alignments (for analog Betacam PAL)
	8-960-098-45	Alignment tape, CR8-1A PS (oxide tape)	—	Audio alignments (for analog Betacam PAL)
㉕	9-911-053-00	Thickness gauge	—	Clearance check
㉖	9-919-573-01	Cleaning liquid	—	Cleaning
㉗	J-6332-240-A	VISC phase adjusting tool	—	VISC alignment for PAL system (for DNW-A65P only)
㉘	J-6530-650-A	Head tip protruction measurement gauge	—	Head tip protrusion check of the video heads
㉙	J-6190-800-A	Tension regulator slantness check tool	[BW-080]	Slant guide slantness adjustment
㉚	A-8319-485-A	IC memory card box, CDS-20 assembly	—	Software update
㉛	1-772-003-11	IC memory card (2 MB), MB98A81183	—	Software update
	1-772-004-11	IC memory card (4 MB), MB98A81273	—	Software update

① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪ 	⑫ 
⑬ 	⑭ 	⑮ 	⑯ 
⑰ 	⑱ 	⑲	⑳
㉑ 	㉒ 	㉓ 	㉔ 
㉕ 	㉖	㉗ 	㉘ 
㉙ 	㉚ 	㉛ 	

1-6-2. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as a standard product.

Equipment	Model name	Remarks
Analog composite video signal generator (with GENLOCK mode)	Tektronix 1410	(For 525/60 system)
	Tektronix 1411	(For 625/50 system)
Analog composite video signal generator	Tektronix TSG-170A	(For 525/60 system)
	Tektronix TSG-271A	(For 625/50 system)
Spectrum analyzer	Advantest R3261A	With external trigger function Bandwidth: more than 100 MHz
Oscilloscope	Tektronix 2465B	
Analog component waveform monitor	Tektronix WFM300 or WFM300A	For measuring analog component video levels
Serial component waveform monitor	Tektronix WFM601	
Analog composite waveform/vector monitor	Tektronix 1750 or 1780R	For measuring analog composite SC-H (For 525/60 system)
	Tektronix 1751 or 1781R	For measuring analog composite SC-H (For 625/50 system)
Audio analyzer	Tektronix AA501A (OP.02)	For measuring levels (dBm), distortion, and dB ratio
Audio level meter	Hewlett-Packard HP3400A	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
Monitor with serial digital input	Sony BVM-1311 (with optional accessory BKM-2085-14)	(For 525/60 system)
	Sony BVM-1411 (with optional accessory BKM-2085-14)	(For 625/50 system)
Network analyzer	Anritsu MS420B	
Time code reader	Sony BVG-1500	(For 525/60 system)
	Sony BVG-1500PS	(For 625/50 system)
Terminator	—	75-ohm, BNC type
BNC T adapter	—	75-ohm

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1-7. Internal Video Test Signal

VTR has the internal video test signal generator.
There are two ways to generate the test signal with this generator.

- Setup extend menu
  ITEM-710 : INTERNAL VIDEO SIGNAL GENERATOR
  For detail, refer to “7-3. Extend Menu” of the operation manual.
- Maintenance mode
  C21 : VIDEO TEST SG
  For detail, refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual Part 1.

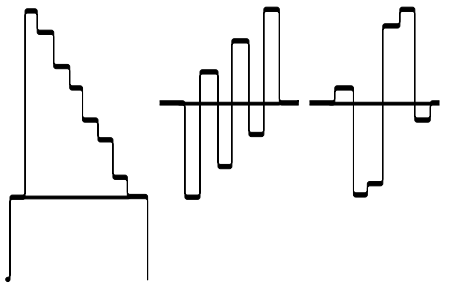
Describes output waveform figures of this generator below. These figures are drawn from waveforms that are watched COMPONENT OUT with the waveform monitor. They are measured with H rate and displayed with PARADE unless otherwise specified.

Note

In the 525/60 system, when selecting either D-1 format or Betacam format, set by the setup extend menu ITEM-709 : CAV LEVEL FORMAT, SUB-ITEM 1 : OUTPUT CAV LEVEL.
In the 625/50 system have no Betacam format.

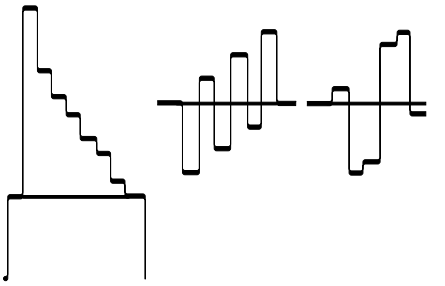
100% Color Bars

D-1 format

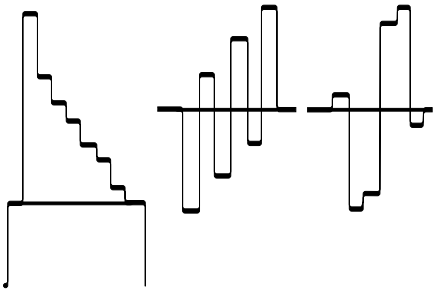


75% Color Bars

D-1 format

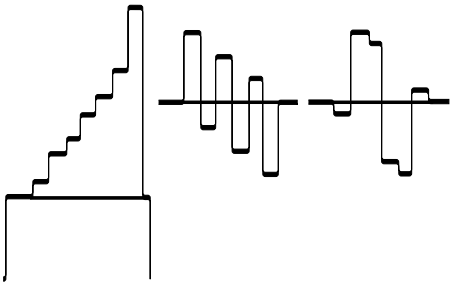


Betacam format

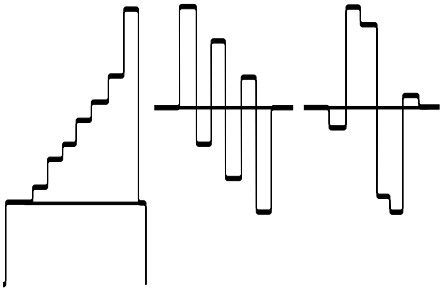


75% Reverse Color Bars

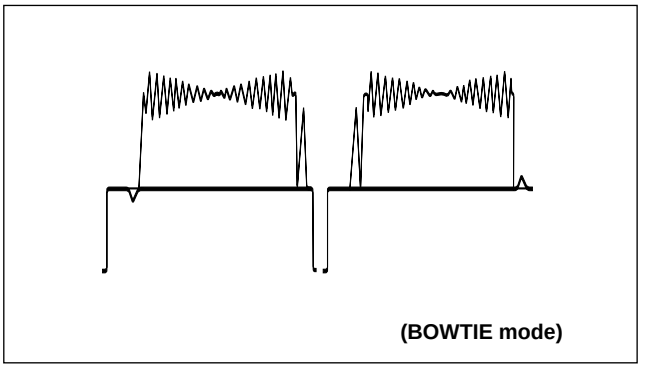
D-1 format



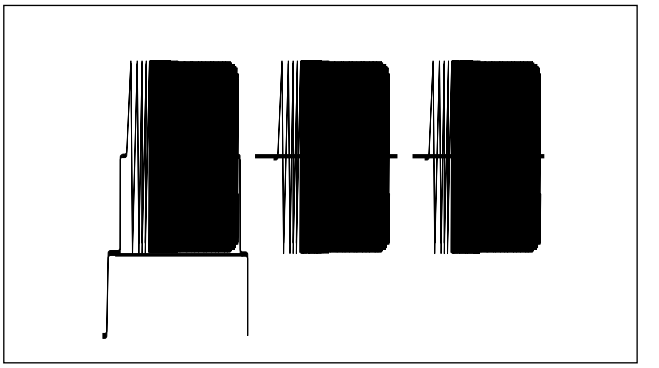
Betacam format (525/60 system only)



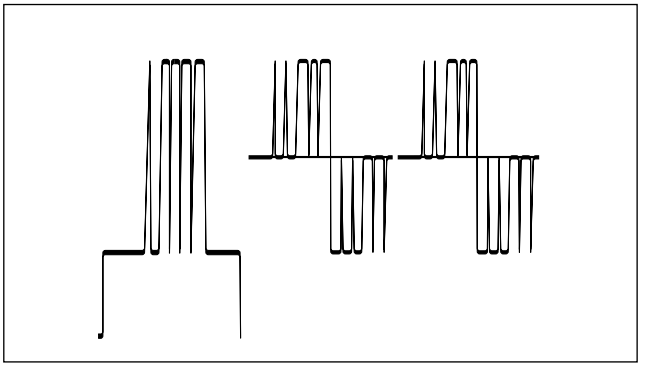
Bowtie



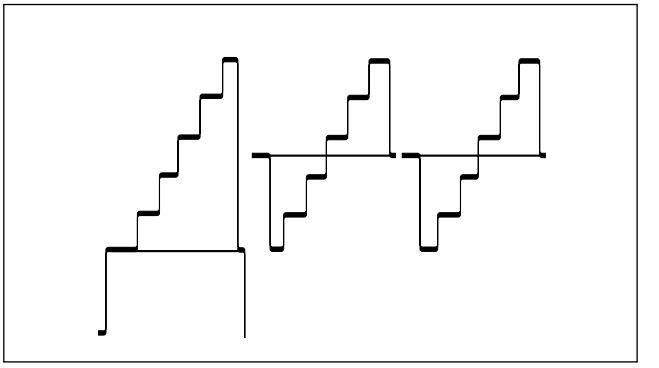
H Sweep



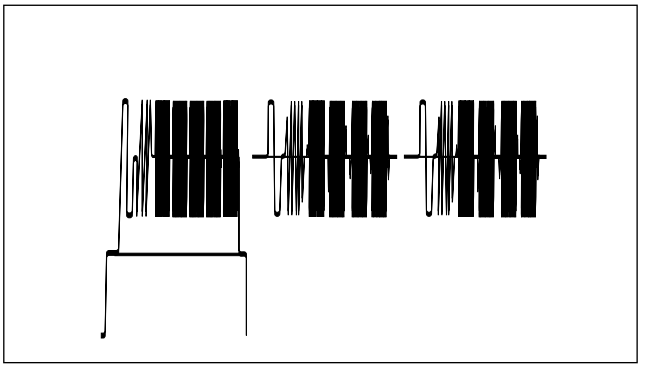
Pulse and Bar



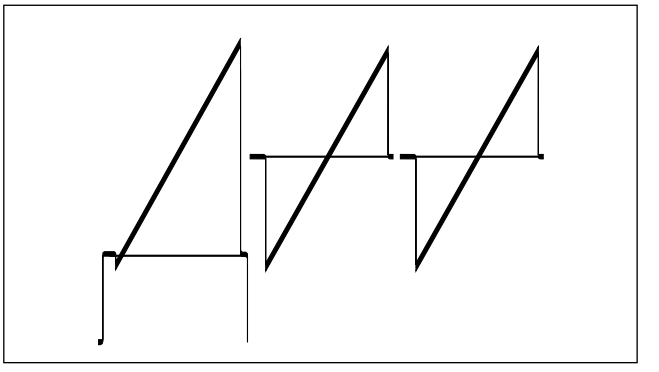
5 step



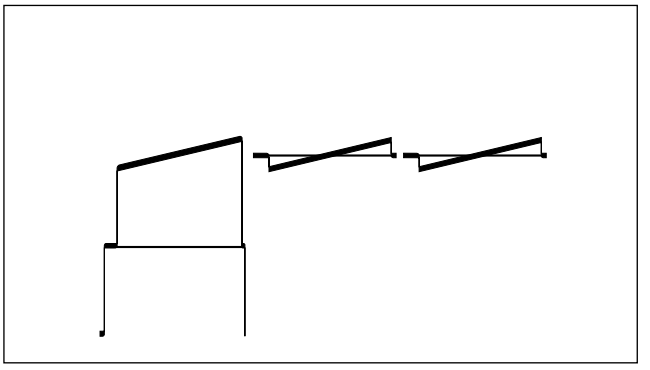
Multi Burst



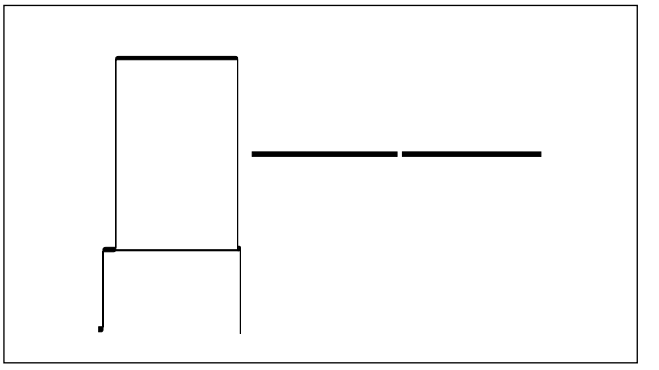
Ramp



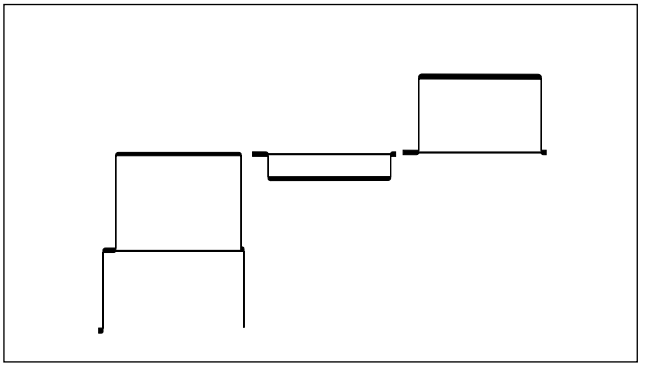
Shallow Ramp



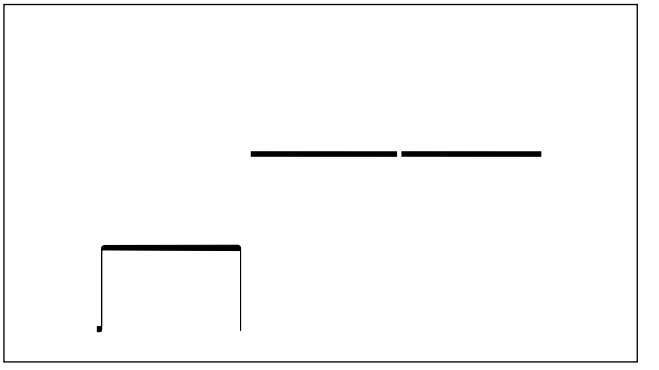
100% Flat



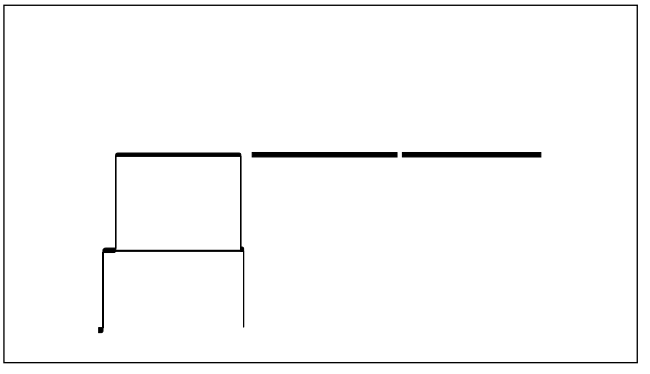
Red Signal



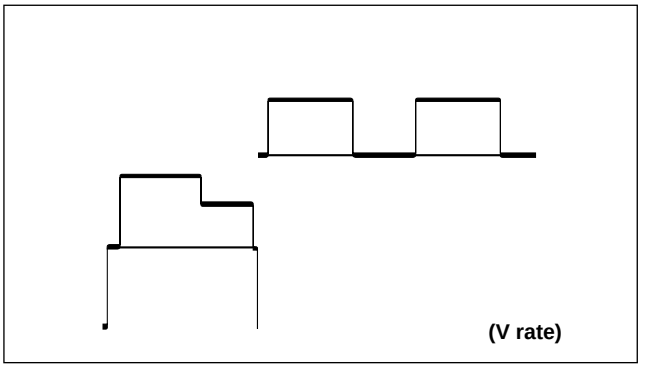
Black Burst



50% Flat

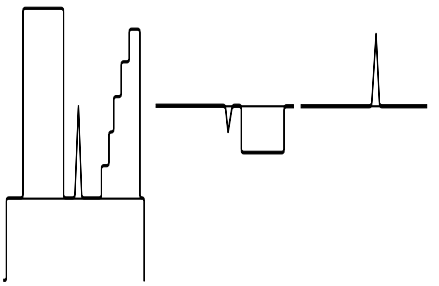


Pathological Check Code

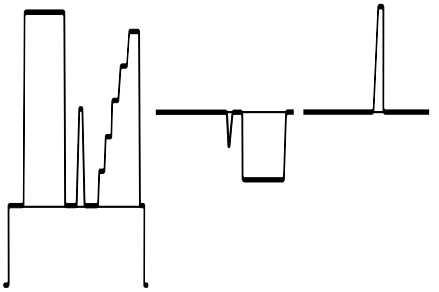


NTC7 (NTSC) (525/60 System only)

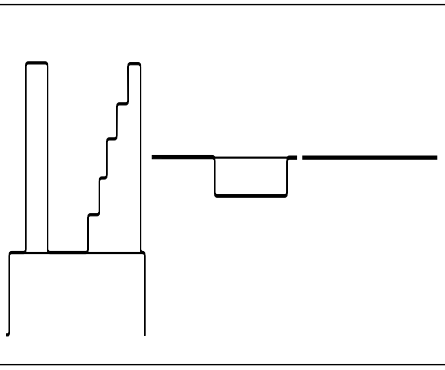
D-1 format



Betacam format



Line330 (625) (625/50 System only)



1-8. Extension Board

Extension board to extend the plug-in board is available in three types.

For Large Plug-in Board

Description: Extension board (L), EX-555
SONY part No.: A-8277-211-A

For Small Plug-in Board

For the small plug-in board is available in following two types.

1. For AU-260, EQ-75, and SDI-41 boards

Description: Extension board (S), EX-556
SONY part No.: A-8277-212-A

2. For DM-89 and TBC-23A/24 boards

Description: Extension board (S), EX-377
SONY part No.: J-6269-810-A

1-9. Service Action after Replacing or Repairing the Board

After replacing or repairing the mounted circuit board in this VTR, be sure to perform the following adjustment or the function check.
Moreover, when the SS-83 board is replaced, it is required to check the setting.

Note

When using the menu of the setup or maintenance mode, connect the analog composite video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1-9-1. AC-169 Board

After replacing or repairing this board, turn the power on and check that the power is correctly applying to the VTR by the rotation of fan motor or condition of indicator.

1-9-2. APR-40 Board

After replacing or repairing this board, perform the audio system alignment (Sections 2-7-3 to 2-7-5).

1-9-3. AU-260 Board

After replacing or repairing this board, perform the LAU/AFM PB system adjustment (Sections 2-7-6 and 2-7-7).

1-9-4. CCM-15 Board

For the threading motor

After replacing or repairing this board, check the functions of the threading motor using C012 : THREADING MOTOR in the maintenance mode.

(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

For the reel position motor

After replacing or repairing this board, check the functions of the reel shift motor using C016 : REEL POSITION MOTOR in the maintenance mode.

(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

Note

Since the mounted CCM-15 board is out of service part, prepare the plain CCM-15 board and the components of the CCM-15 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-9-5. CL-29 Board

After replacing or repairing this board, check that the compartment block in the cassette compartment moves up and down normally using C013 : CASSETTE COMP MOTOR. of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-6. CP-278 Board

After repairing this board, perform the following checks.

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent

Checks

1. To generate the test signal within VTR, select “1KHz SINE 0VU” using C23 : AUDIO TEST SG of the maintenance mode.
   (Refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.)
2. Check that the audio level at AUDIO OUTPUT connector is 4.0 ±0.5 dBm by the audio analyzer for each channel.
3. Exit the maitenance mode.

1-9-7. CP-301 Board

After repairing this board, perform the following checks.

Preparing tools

- Time code reader
  525/60 system: SONY BVG-1500 or equivalent
  625/50 system: SONY BVG-1500PS or equivalent
- Audio analyzer:
  TEKTRONIX AA501A option-02 or equivalent
- Alignment tape:
  525/60 system: SR5-1 (Part No. 8-960-075-01)
  625/50 system: SR5-1P (Part No. 8-960-075-51)

Checks

1. Connect the time code reader to TIME CODE OUT connector.
2. Set the upper control panel as follows:
   TC/AUTO/VISC: LTC
3. Play back the SR5-1/SR5-1P and check that the reader can read correctly.
4. Return the above switches in the upper control panel to the customer settings.
5. To generate the test signal within VTR, select “1KHz SINE 0VU” using C23 : AUDIO TEST SG of the maintenance mode.
   (Refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.)
6. Check that the audio level at MONITOR OUTPUT L connector is 4.0 ±0.5 dBm by the audio analyzer.
7. Check that the audio level at MONITOR OUTPUT R connector is 4.0 ±0.5 dBm by the audio analyzer.
8. Exit the maintenance mode.

1-9-8. CP-334 Board

Perform the following check after replacing or repairing this board.

Preparing tools

- Analog composite video signal generator:
  TEKTRONIX TSG-170A or equivalent
- Analog component video monitor
  Used for displaying of the menu. Usually, connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminator (1 piece.)

Preparations

1. Set the CHARACTER switch on the sub control panel to ON.
2. Set the operation system in the VTR using the setup menu ITEM-013 as follows:
   DNW-A65: 525/60 system
   DNW-A65P: 625/50 system
   (Refer to Section 7-2-2 of the operation manual.)
3. Set the setup extend menu ITEM-105 to “ON”.

Checks

1. Input the analog composite video signal (BB signal) to REF. VIDEO connector (75 Ω switch: ON).
2. Check that the STOP button is not blinking.
3. Disconnect the cable which is connected to REF. VIDEO connector.
4. Check that the STOP button is blinking.

Perfection

1. Return the setup extend menu ITEM-105 to the customer setting.
2. Return the CHARACTER switch to the customer setting.

1-9-9. CP-335 Board

After replacing or repairing this board, perform the following check.

Preparing tools

- Equipment to input the AES/EBU signal
  e. g. DNW-A75, DVW-A500

Checks

1. Connect the equipment to input the AES/EBU signal to CH1/2 and CH3/4 of AUDIO OUTPUT (AES/EBU).
2. To generate the test signal , select “1KHz SINE 0VU” using C23 AUDIO TEST SG of the maintenance mode.
   Refer to “4-2-5. AUDIO/VIDEO CHECK Mode (C2)” of the maintenance manual part 1.
3. Check that the level of CH1 to CH4 indicate −20 dBFS by the level meters of equipment to input the AES/EBU signal.
4. Exit the maintenance mode.

1-9-10. DM-89 Board

Note

The board that a suffix of service parts cord is A is inavailable for this unit.

After replacing or repairing this board, perform the analog Betacam PB system adjustment (Sections 2-11-2 to 2-11-19).

1-9-11. DPR-118 Board

After replacing or repairing this board, check that the VTR is able to correctly play back the audio and video.

1-9-12. DR-315 Board

After replacing or repairing this board, perform the servo system electrical adjustments (Sections 2-5-3 and 2-5-5).

1-9-13. DT-34D Board

After replacing or repairing this board, perform the analog DT system adjustment (Sections 2-5-6 and 2-5-7).

1-9-14. EQ-75 Board

After replacing or repairing this board, perform the RF system electrical adjustments (Section 2-6).

1-9-15. FP-117 Board

After replacing or repairing this board, perform the electrical adjustments (Section 2-12).

1-9-16. KY-438 Board

After replacing or repairing this board, check the functions of the switches, indicators, etc. on this board.

1-9-17. LP-81 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment when inserting the cassette tape.
2. Check that the all cassette compartment lamps (LEDs) are lighted with the cassette tape inserted.

1-9-18. MB-818 Board

After replacing or repairing this board, check the VTR's basic function is correct.

1-9-19. MS-58 Board

After replacing this board or its NV-RAM

1. Perform the servo/DT system electrical adjustments (Section 2-5).
   Note
   Be sure to adjust after initializing the servo adjustment data in the NV-RAM on the MS-58 board.
   (Refer to Section 2-5-2.)
2. Set the serial number of the VTR using M31 : SERIAL NUMBER in the maintenance mode.
   (Refer to "4-4-3. SERIAL NUMBER Display Menu (M31)" of the maintenance manual part 1.)
3. Set the head room of the audio level meter using M37 : METER HEAD ROOM in the maintenance mode.
   (Refer to "4-4-7. METER HEAD ROOM Setup Menu (M37)" of the maintenance manual part 1.)

After repairing (except the NV-RAM replacement):

Usually perform the servo system alignment (Section 2-5).
When repairing the circuit containing from RV901 to CN24 in the demagnetization head driving circuit on the MS-58 board, perform "2-4. Demagnetization Head Driving Voltage Adjustment".

1-9-20. PC-70 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the cassette compartment using C013 : CASSETTE COMP MOTOR. in the maintenance mode.
   (Refer to "4-2-2. SERVO CHECK Mode (C00-03)" of the maintenance manual part 1.)
2. Check the functions of the cassette size sensors and cassette-in sensors in the cassette compartment using C001 : CASSETTE COMP. SW in the maintenance mode.
   (Refer to "4-2-2. SERVO CHECK Mode (C00-03)" of the maintenance manual part 1.)

1-9-21. PD-35 Board

After replacing or repairing this board, check the function of the pinch solenoid using C020 : PINCH ROLLER of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

Note

Since the mounted PD-35 board is out of service part, prepare the plain PD-35 board and the components of the PD-35 board when replacing this board.
For the mounted component on this board, refer to Section 3 of the maintenance manual part 2, volume-2.

1-9-22. PTC-54 Board

After replacing or repairing this board, check that error code 09 does not occur while the tape is threading.

1-9-23. PTC-59 Board

Note

Since the mounted PTC-59 board is out of service part, be sure to replace the MC sensor assembly when needing to replace this board.

After replacing the MC sensor assembly or repairing this board, check the functions of the cassette tab sensors using C000 : CASSETTE SW in the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-24. PTC-69 Board

After replacing or repairing this board, perform the electrical adjustments (Section 2-3).

Note

When replacing the search dial assembly, the electrical adjustments for the PTC-69 board is not needed.

1-9-25. PTC-71 Board

After replacing or repairing this board, check the functions of the reel position sensors using C016 : REEL POSITION MOTOR of the maintenance mode.
(Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-26. RM-181 Board

After replacing or repairing this board, perform “Adjustment after Replacement” in “3-15. Reel Motor Assembly Replacement”.

1-9-27. RM-130 Board

After replacing or repairing this board, check that the error (error code 92) does not exist after turning the power ON.

1-9-28. RM-179 Board

After replacing the board or its NV-RAM

Execute RESET ALL DATA of M392: NV-RAM CONTROL in the maintenance mode to reset to the factory setting data.
Refer to “4-4-8. 50PIN DATA ASSIGN Mode (M39)” of the maintenance manual Part 1.

After repairing the board
(except to replacing the NV-RAM)

Check that the error (error code 95) does not exist after turning the power ON.

1-9-29. SDI-41 Board

After replacing or repairing this board, perform the following check.

Tools

- Video monitor for the serial digital input:
  SONY BVM-1410 (with optional BKM-2085-14) or equivalent

Check

1. Select “75 % Color Bars” of C21: VIDEO TEST SG in the maintenance mode and generate the video test signal.
   Refer to “4-2-5. AUDIO/VIDEO CHECK MODE (C2)”of the maintenance manual Part 1.
2. Check that no abnormality exists in the picture watching the video monitor connected to each SDI OUTPUT connector. (1, 2 and 3)

1-9-30. SE-344 Board

Note

Since the mounted SE-344 board and the component on this board are out of service parts, be sure to replace the reel FG assembly when needing to replace/repaire this board.

After replacing the reel FG assembly, perform “3-15-7. Reel Table Rotation Sensor Position Adjustment”.

1-9-31. SE-461 Board

After replacing or repairing this board, perform the following checks.

1. Check the function of the dew condensation sensor using C003 : DEW SENSOR in the maintenance mode.
   (Refer to “4-2-2. SERVO CHECK Mode (C00-03)” of the maintenance manual part 1.)

1-9-32. SS-83 Board

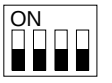
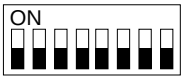
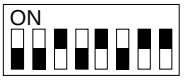
When replacing:

When replacing this board, perform the followings.

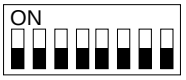
1. Check the settings of the setup menu (main and extended menus).
   Write the setting of the setup menu on a copy of “Appendix B. Setting Check Sheet” in the maintenance manual Part 1 if possible.
2. Check that the DIP switches S101, S1100, S1900, S2100 and S2701 are set as following. Moreover set S1102 as following.

Note

- ■ marks stand for the position of knobs
- The description for each DIP switch is described in Section 1-10-5 of the maintenance manual Part 1.

Ref No.	Setting	Remarks
S101		Factory setting
S1100		• Perform the setup menu reset which should be done after board replacement, then set No.1 switch to the same setting as the removed SS-83 board.
S1102	DNW-A65 DNW-A65P TTV4065P  TTV4065N 	Factory setting
S1900		Factory setting

http://getMANUAL.com

Ref No.	Setting	Remarks
S2100		Factory setting
S2701		Factory setting

After replacing

After replacing or repairing this board, perform the following checks.

1. Reset the setup menu (main and extended menus) as setting written on a copy of the setting check sheet.
2. Clear the error logger using the error logger display mode of the maintenance mode.
   Refer to “4-3. Error Logger Display Mode (M2)” in the maintenance manual Part 1.
3. Set the calendar/clock using the error logger display mode of the maintenance mode.
   Refer to “4-3. Error Logger Display Mode (M2)” in the maintenance manual Part 1.

After replacing the NV-RAM

Perform the service action after replacing referring to “1-3. NV-RAM”.

After repairing the board (except replacing the NV-RAM)

Perform the servo/DT system electrical adjustment (Section 2-5).

1-9-33. SWC-31 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

Note

Perform the system phase adjustment again for the VTR referring to the manual of the analog switcher when using the analog switcher with this VTR.

1-9-34. SWC-35 Board

After replacing or repairing this board, check the functions of the switches and indicators on this board.

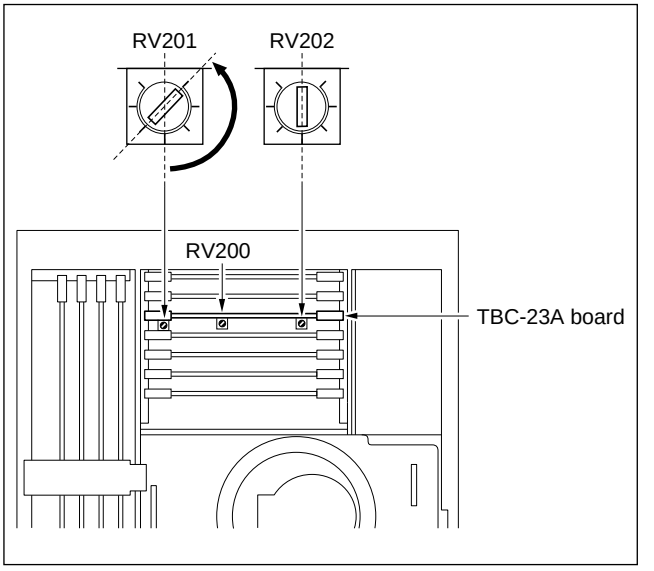
1-9-35. TBC-23A Board

After replacing:

Perform the analog Betacam PB system adjustment (Sections 2-11-2, 3, 24, 25, and 28).

After repairing:

1. Set RV201 and RV202 on the TBC-23A board as shown figure below.



RV201 and RV202 on TBC-23A Board

2. Perform the analog Betacam PB system adjustment (Sections 2-11-2, 3, 24, 25 and 28).

1-9-36. TBC-24 Board

Note

The boards of board number suffix 11 through 15 are inavailable for this unit without completing the specified modification to them.

After replacing:

Perform the analog Betacam PB system adjustment (Sections 2-11-2 and 2-11-19 or later).

After repairing:

- When RV202 on the TBC-24 board (board number suffix is 16 and higher) for DNW-A65P was replaced, set RV202 to the mechanical center.
- When RV303 on the TBC-24 board was replaced, perform " 2-11-22. TBC VCO Free-running Adjustment" and later (except Section 2-11-23).
- In other case, perform the analog Betacam PB system adjustment (Sections 2-11-2 and 2-11-19 or later).

1-9-37. TC-102 Board

After replacing or repairing this board, perform LCT alignment and full erase current check (Section 2-13).

1-9-38. TR-78 Board

Note

Since the mounted TR-78 board and the component on this board are out of service parts, be sure to replace the S-tension regulator assembly when needing to replace/repaire this board. (Refer to Section 3-23.)

After replacing the S-tension regulator assembly, perform the tape running adjustment (Section 4-1-2).

1-9-39. TR-79 Board

After replacing or repairing this board, perform the following checks.

1. Check the functions of the threading and unthreading sensors using C012 : THREADING MOTOR in the maintenance mode.
   (Refer to "4-2-2. SERVO CHECK Mode (C00-03)" of the maintenance manual part 1.)
2. Execute A008 : S/T TENSION OFFSET in the maintenance mode. Then, save the adjustment data in A012 : NV-RAM CONTROL. Refer to "4-2-7. SERVO ADJUST Mode (A00-01)" of the maintenance manual part 1.

1-9-40. VPR-47 Board

After replacing or repairing this board, perform the video system alignment (Section 2-8).

1-9-41. VR-223 Board

After replacing or repairing this board, check the functions of the volumes on this board.

1-9-42. VR-224 Board

After replacing or repairing this board, check the functions of the switches and volumes on this board.

Section 2
Electrical Alignment

2-1. Electrical Alignment Overview

2-1-1. Notes on Electrical Alignment

- Be sure to adjust each block in order unless any instructions are provided.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.
  Note
  NV-RAM control menu for the servo and DT systems have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 4 of the maintenance manual Part 1.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the maintenance manual Part 1 “Appendix A” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

2-1-2. Outline of Electrical Alignment

In Section 2 explains the all electrical adjustment to each block (include the optional boards).

Block	Reference	Contents	Object of adjustment
Power supply unit	Section 2-2	Output voltage check/adjustment of power supply unit	———
Search dial	Section 2-3	Search dial pulse duty adjustment	PTC-69
Demagnetization head	Section 2-4	Demagnetization head driving voltage adjustment	MS-58
Servo/DT	Section 2-5	Servo system alignment	DT34D, MS-58, SS-83
RF	Section 2-6	RF system alignment	EQ-75
Audio	Section 2-7	Adjustments of Analog audio output line and Analog Betacam LAU/AFM PB line	APR-40, AU-260
Video	Section 2-8	Adjustments of Video reference signal, Video process, and Analog video output	VPR-47
Analog Betacam video	Section 2-10	Analog Betacam video PB system alignment	DM-89, TBC-23A, TBC-24
SDI/SDTI	Section 2-11	Free-running VCO adjustment of Encoder for SDI and SDTI interface	SDI-41, DPR-119
Video remote control	Section 2-12	TBC remote control offset adjustment	FP-117
Time code	Section 2-13	LTC system adjustment/check	TC-102

2-2. Power Supply Line Alignment

2-2-1. Output Voltage Check

When the power supply unit in the VTR was replaced, perform the output voltage check.

Note

Be sure to perform the check before reattaching the bottom plate.

Tool

- Digital voltmeter: ADVANTEST TR6845 or equivalent

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Place the VTR on its right side panel down.
4. When the bottom plate was reattached, remove it. (Refer to Section 2-3-1 of the maintenance manual part 1.)
5. Connect the power cord.
6. Wait for 10 minutes after turning on the power.

Voltage Check

Check each output voltage of power supply lines at the following points.

Note

Measure at the terminal contact of the connected harness wire.

Line	Measurement point	Specification	Remarks
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘
−8 V	CN252-4/MAIN2(glay)	−7.7 ±0.7 V	
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	
−15 V	CN254-9A/MAIN2(glay)	−15.0 ±1.0 V	
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	

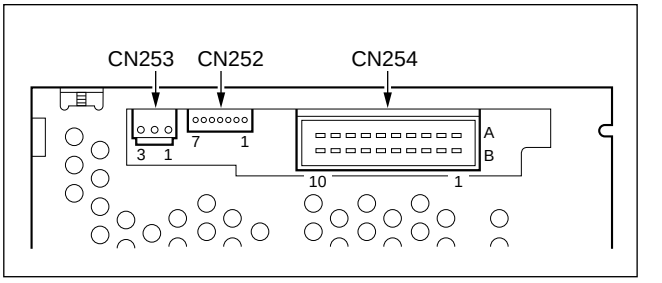
If the specification is not satisfy

- For the power lines with a ⊘-mark in remarks column of the above table: Can be adjusted the output voltage. Be sure to adjust with the power supply unit settled in adjustable condition referring to Section 2-2-2.
- For without a ⊘-mark in remarks column of the above table: Can not be adjusted the output voltage. Replace the power supply unit, or make sure that repair of this unit had been completed.

Note

Pin assignments of the connectors (CN252, CN253, and CN254) in the power supply unit are as follows:

Ref. No.	Pin No.	Output voltage (Signal name)	Wire color
CN252	1	GND	White
	2	GND	Gray
	3, 4	−8 V	Gray
	5	(FAN MOTOR CHECK)	Gray
	6	+12 V	Gray
	7	GND	Gray
CN253	1	18 V (UNREG +18 V)	Brown
	2, 3	GND (UNREG GND)	Black
CN254	1A, 2A	+3.4 V	Orange
	3A, 4A	+5.1 V	Brown
	5A, 6A	+8 V	Red
	7A, 8A	GND	Black
	9A	−15 V	White
	10A	GND	Black
	1B, 2B	+3.4 V	Orange
	3B, 4B	+5.1 V	Brown
	5B	+2.5 V	Blue
	6B	+8 V	Red
	7B, 8B	GND	Black
	9B	+15 V	White
	10B	GND	Black



Power Supply Unit (MAIN2 Board)

2-2-2. Output Voltage Adjustment

When the power supply unit was repaired, perform the adjustment (check) under disclosing the power supply unit.

CAUTION

Since the primary circuit is exposed, be extremely careful with not to get an electric shock.
When completing the adjustments and checks, turn off the POWER switch without delay.

Tools List

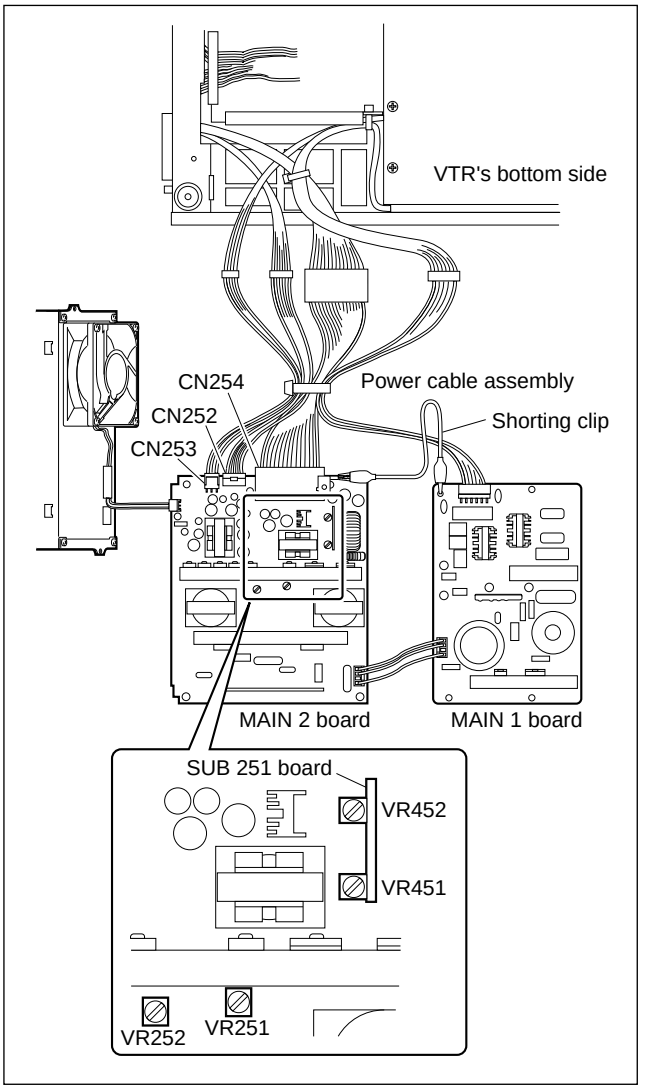
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Power cable assembly (Part No. A-8321-333-A)
- Shorting clip

Preparation

1. Turn off the power.
2. Disconnect the power cord and all cables on connector panel.
3. Remove the power supply unit.
   (Refer to Section 3-29.)
4. Reattach a power supply panel assembly under staying on the VTR's right side panel down.
   (Do not reattach the bottom plate.)
5. Connect the four connectors of the power cable assembly to each connector of the VTR's harnesses that were connected to the power supply unit before.
6. Take a power supply unit to pieces as figure of right.
   (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
7. Reconnect the MAIN1 board and MAIN2 board with a harness of the power supply unit.
8. Connect the four connectors of the power cable assembly to the MAIN1 board and MAIN2 board.

   Note

   Be sure to confirm that nothing is the cause of the short circuit under the MAIN1 and MAIN2 boards.
9. Connect both GND of the MAIN1 board and MAIN2 board with a shorting clip.
10. Connect the power cord.
11. Wait for 10 minutes after turning on the power.



Voltage Adjustment (Check)

Adjust and check each output voltage of power supply lines at the following points.

Line	Measurement point	Specification	Adjust. point
+3.4 V	CN254-1A/MAIN2(orange)	+3.4 ±0.3 V	Check only
+5.1 V	CN254-3A/MAIN2(brown)	+5.2 ±0.3 V	⊘VR251/MAIN2
+8 V	CN254-5A/MAIN2(red)	+7.7 ±0.7 V	⊘VR252/MAIN2
–8 V	CN252-4/MAIN2(glay)	–7.7 ±0.7 V	Check only
+15 V	CN254-9B/MAIN2(blue)	+15.0 ±1.0 V	Check only
–15 V	CN254-9A/MAIN2(glay)	–15.0 ±1.0 V	Check only
+12 V	CN252-6/MAIN2(glay)	+12.0 ±1.0 V	Check only
+2.5 V	CN254-5B/MAIN2(yellow)	+2.5 ±0.2 V	⊘VR452/SUB251
+18 V	CN253-1/MAIN2(brown)	+18.0 ±2.0 V	Check only

2-3. Dial Pulse Adjustment (PTC-69 Board)

When the PTC-69 board was replaced or the dial pulse generating circuit on the PTC-69 board was repaired, perform the dial pulse adjustment.

Note

Be sure to perform the adjustments with the search dial assembly separated from the lower control panel assembly. When uniting both assemblies, remove the search dial assembly from the lower control panel assembly as follows:

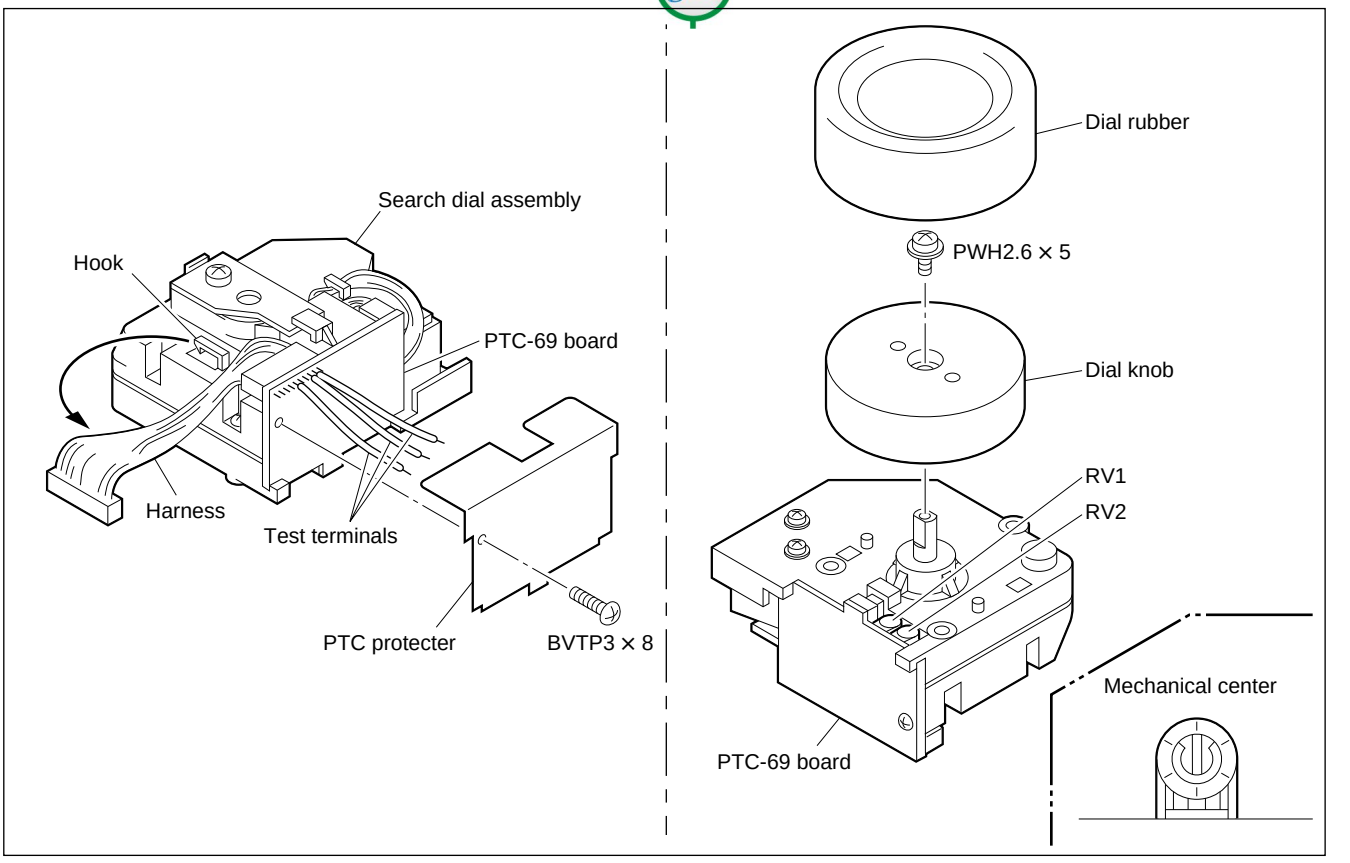
1. Remove a panel from the lower control panel assembly. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Remove the dial rubber, dial knob, and search dial assembly from the lower control panel assembly. (Refer to the exploded views in Section 2 of the maintenance manual part 2, volume-2.)
3. Disconnect the harness from CN69 on the KY-438 board of the lower control panel assembly.

Tools List

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Solder iron
- Test terminals, such as covered wire (3 pieces)

Preparation

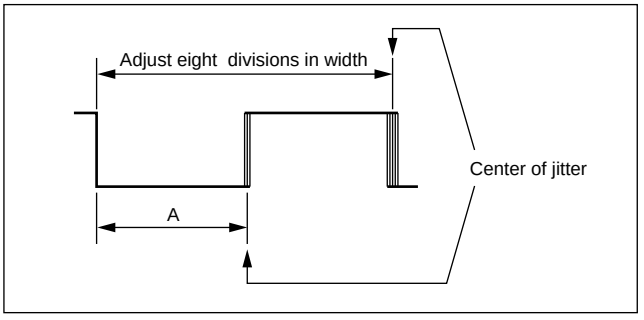
1. Remove the PTC protector after removing a screw.
2. Solder the three test terminals to the connector CN2's pins 2, 3 and 6 on side B of the PTC-69 board.
3. Fix the PTC-69 board with a screw that is removed at step 1 (without the PTC protector).
4. Attach the dial knob and dial rubber to the search dial assembly.
5. When the PTC-69 board is replaced, set RV1 and RV2 to the mechanical center.
   When the potentiometer RV1 or RV2 is replaced, set it (RV1 or RV2) to the mechanical center.
6. Connect the harness to CN69 of the KY-438 board with this harness unhooked.
7. Turn on the POWER switch.
8. To turn the search dial to JOG mode, press the JOG button.



Preparation

Adjustment (Check)

1. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 2 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
2. During turn the search dial at uniform speed and reverse direction (↺), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
3. During turn the search dial at the same as step 2, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV1/PTC-69 (inside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)
4. Connect the oscilloscope's CH-1 input as follows:
   X: Pin 3 of CN2 (soldered test terminal)
   G: Pin 6 of CN2 (soldered test terminal)
5. During turn the search dial at uniform speed and forward direction (↻), adjust the sweep time on the oscilloscope to align the 1 cycle waveform to 8 divisions width.
6. During turn the search dial at the same as step 5, checks that the duty ratio on waveform satisfy the specification. If the specification is not satisfied, perform the adjustment.
   Adj. point: ⊘RV2/PTC-69 (outside RV)
   Specification: Duty ratio 0.50 ±0.04
   (A = 4.0 ±0.3 divisions width)



Waveform on Oscilloscope

Perfection

1. Turn off the POWER switch.
2. Unsolder and remove the three test terminals from CN2 on the PTC-69 board.
3. Remove a screw fixing the PTC-69 board, then fix the PTC-69 board and PTC protector with removed screw.
4. Hook the harness that connected to the lower control panel assembly.
5. Remove the dial rubber and dial knob from the search dial assembly.
6. Reinstall the search dial assembly to the lower control panel assembly.
7. Reattach the panel on the lower control panel assembly.
8. Reattach the dial knob and dial rubber.

2-4. Demagnetization Head Driving Voltage Adjustment (MS-58 Board)

When the related circuit from RV901 to CN24 in the demagnetization head driving circuit on the MS-58 board was repaired, perform this adjustment.

Note

Be sure to adjust with the shield plate (bottom) removed. When the shield plate (bottom) was reinstalled, remove it.

Tools List

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Betacam SP cassette tape (metal particle type)

  Note

  Never use the alignment tape because it may dwindle the magnetic potential of this tape.

Preparation

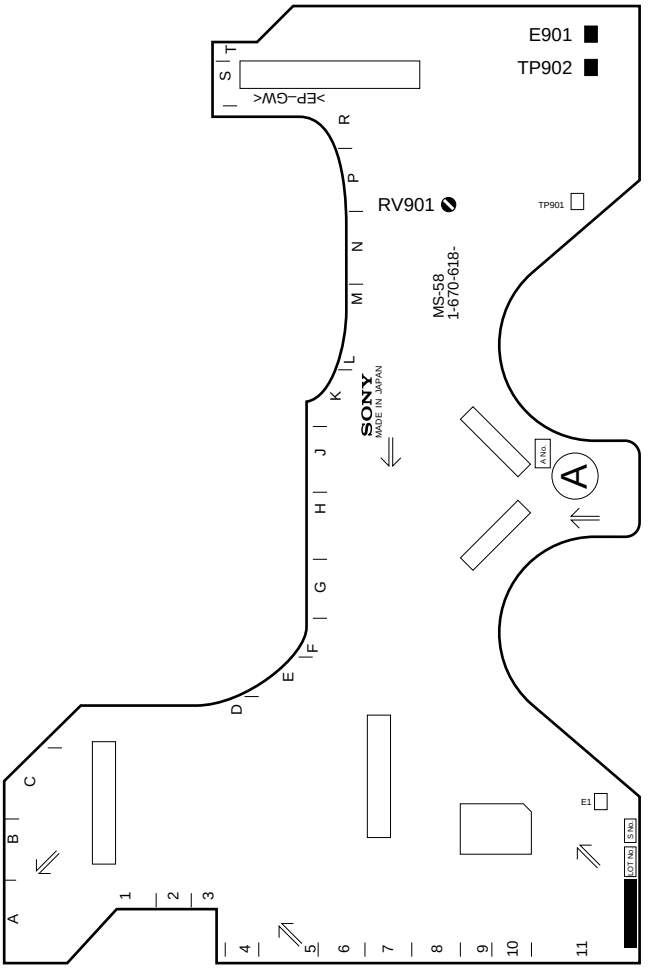
1. Connect the power cord and turn on the power.
2. Insert the Betacam SP cassette tape (metal particle type).
3. Turn off the power.
4. Place the VTR with its right side panel down.

Adjustment

1. Connect the digital voltmeter to TP902(S-11) on the MS-58 board.
   GND: E901/MS-58(T-11)
2. Turn on the power.
3. During play back the inserted cassette tape in PLAY mode, adjust so that the measuring voltage satisfy the specification.
   Adj. point: ⊘RV901/MS-58(P-8)
   Specification: 180 $^{+5}_{-10}$ mV dc

Perfection

1. Turn off the power.
2. Reattach the shield plate (bottom).
3. Reattach the bottom plate.
4. Replace the VTR to normal from falling sideways.
5. Turn on the power.
6. Eject the cassette tape.



MS-58 Board (Side A)

2-5. Servo/DT Systems Alignment

2-5-1. Adjustment Overview

All the adjustments of the servo and DT systems are adjusted using the menus in the maintenance mode. When the MS-58 board or NV-RAM (IC9/MS-58 board) was replaced, be sure to initialize the NV-RAM referring to Section 2-5-2 before starting the adjustments of the servo/DT systems alignment.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.
The countermeasures against the malfunction of an automatic adjustment (an error message "ADJUST IN-COMPLETE" will be displayed on the video monitor) had been described there.

Tools List

To perform the servo system alignment for the VTR, prepare the following equipment and fixtures.

- Alignment tapes: SR2-1 (Part No. 8-960-075-11),
  SR2-1P (Part No. 8-960-075-61),
  CR2-1B (Part No. 8-960-096-01),
  and CR2-1B PS (Part No. 8-960-096-51)
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Remarks
2-5-2	Servo/DT adjustment data initialization		S100/SS-83	Perform Section 2-5-2 only when replacing the MS-58 board or NV-RAM (IC9/MS-58).
2-5-3	Servo continuity automatic adjustment		A000 : A001-A008 ADJ.	S reel FG duty adjustment (A001) T reel FG duty adjustment (A002) Capstan FG duty adjustment (A003) S reel offset/friction adjustment (A004) T reel offset/friction adjustment (A005) S reel torque adjustment (A006) T reel torque adjustment (A007) S/T reel tension offset adjustment (A008)
		Data save	A012 : NV-RAM CONTROL	
2-5-4	Capstan free speed adjustment		A010 : CAPSTAN FREE SPEED	Perform the adjustment and data saving in both
	(Standard video system)	Data save	A012 : NV-RAM CONTROL	525/60 and 625/50 systems.
2-5-5	RF switching position adjustment		A011 : RE SWITCHING POS.	Perform the adjustment and data saving in either
		Data save	A012 : NV-RAM CONTROL	525/60 or 625/50 system.
2-5-6	DT system adjustment (Standard video system)			Perform the adjustment and data saving in both
	DT head offset level adjustment		A030 : HEAD OFFSET LEVEL	525/60 and 625/50 systems.
	DT drive gain adjustment		A031 : DRIVE GAIN	
		Data save	A032 : DATA SAVE	
2-5-8	Capstan free speed adjustment		A010 : CAPSTAN FREE SPEED	
	(Another video system)	Data save	A012 : NV-RAM CONTROL	
2-5-9	DT system adjustment (Another video system)			
	DT head offset level adjustment		A030 : HEAD OFFSET LEVEL	
	DT drive gain adjustment		A031 : DRIVE GAIN	
		Data save	A032 : DATA SAVE	

2-5-2. Servo/DT Adjustment Data Initialization

After replacing the MS-58 board or NV-RAM (IC9/MS-58 board) on, have to initialize the servo/DT adjustment data stored the NV-RAM on MS-58 board.
Can to initialize in the following procedure.

Note

After the initialization, be sure to perform Section 2-5-3 through 2-5-10.

How to initialize

With S100/SS-83(D-1) pressing, turn on the power.
Before releasing S100, wait for three seconds after the power-on.

Note

If the system error (ERROR-97) occurs at this time, turn off the power and retry.

2-5-3. Servo Continuity Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A000 : A001-A008 ADJ.
3. To execute this adjustment, press the SET button once on the lower control panel.
   - The execution time is about 150 seconds.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit the this menu, press the MENU button once on the lower control panel.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustment was not completed normally.

5. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
6. To exit the maintenance mode, press the MENU button five times.

2-5-4. Capstan Free Speed Adjustment (Standard Video System)

Prepare the following two alignment tapes to perform this adjustment.
DNW-A65 (at 525/60 system): SR2-1 and CR2-1B
DNW-A65P (at 625/50 system): SR2-1P and CR2-1B PS

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN FREE SPEED.
3. Insert the alignment tape SR2-1 (or SR2-1P), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit this menu, press the MENU button once.
5. To exit A00-01 : SERVO ADJUST, press the MENU button once.
6. Enter A00-01 : SERVO ADJUST again.
   - The alignment tape is ejected.
7. Enter A010 : CAPSTAN FREE SPEED again.
8. Insert the alignment tape CR2-1B (or CR2-1B PS), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
9. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

10. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
11. To exit the maintenance mode, press the MENU button five times.
12. Eject the alignment tape.

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2-5-5. RF Switching Position Adjustment

Prepare the following alignment tape to perform this adjustment.

- SR2-1 (at 525/60 system)
- SR2-1P (at 625/50 system)

Note

Be sure to adjust in either 525/60 or 625/50 system. When the adjustment is performed in one system, it is not required in the other system.

1. Insert the alignment tape SR2-1/SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select “AUTO”.
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

2-5-6. DT System Adjustment (Standard Video System)

Prepare the following alignment tape to perform this adjustment.

DNW-A65 (at 525/60 system): CR5-1B or CR5-2A
DNW-A65P (at 625/50 system): CR5-1B PS or CR5-2A PS

1. DT Head Offset Level Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2. DT Drive Gain Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   - The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   - The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   - The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

3. Data Save (Store the Adjusted Data)

1. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

2. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically..

2-5-7. Preparation in Another Video System

Note

Be sure to perform the adjustments in the another video system after completing the adjustments in the standard video system.

Switch the video system to the another video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.)
And switch the video system of the video monitor.
DNW-A65: 625/50 system (PAL)
DNW-A65P: 525/60 system (NTSC)

2-5-8. Capstan Free Speed Adjustment (Another Video System)

Prepare the following two alignment tapes to perform this adjustment.
DNW-A65 (at 625/50 system): SR2-1P and CR2-1B PS
DNW-A65P (at 525/60 system): SR2-1 and CR2-1B

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A010 : CAPSTAN FREE SPEED.
3. Insert the alignment tape SR2-1P (or SR2-1), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
4. To exit this menu, press the MENU button once.
5. To exit A00-01 : SERVO ADJUST, press the MENU button once.
6. Enter A00-01 : SERVO ADJUST again.
   - The alignment tape is ejected.
7. Enter A010 : CAPSTAN FREE SPEED again.
8. Insert the alignment tape CR2-1B PS (or CR2-1B), then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
9. To exit this menu, press the MENU button once.

Data save (store the adjusted data)

10. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
11. To exit the maintenance mode, press the MENU button five times.
12. Eject the alignment tape.

2-5-9. DT System Adjustment (Another Video System)

Prepare the following alignment tape to perform this adjustment.
DNW-A65 (at 625/50 system): CR5-1B PS or CR5-2A PS
DNW-A65P (at 525/60 system): CR5-1B or CR5-2A

1. DT Head Offset Level Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2. DT Drive Gain Adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   - The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   - The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   - The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

3. Data Save (Store the Adjusted Data)

1. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
2. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

2-5-10. Perfection

Return the video system to standard video system of this unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.)
And return the video system of the video monitor.
DNW-A65: 525/60 system (NTSC)
DNW-A65P: 625/50 system (PAL)

2-6. RF System Alignment (EQ-75 Board)

2-6-1. Adjustment Overview

There are the following in the RF system of the VTR.
- Record system of the Betacam SX format
- Playback system of the Betacam SX format
- Playback system of the Betacam / Betacam SP formats

For the RF adjustment for the Betacam SX format (playback), perform the automatic adjustments in the menu of the maintenance mode.
For the Betacam / Betacam SP format, perform the manually adjustments in the menu of the maintenance mode.

For the DNW-A65's Betacam / Betacam SP PB function, be sure to adjust in the 525/60 system.
For the DNW-A65P's Betacam / Betacam SP PB function, be sure to adjust in the 625/50 system.
If differing, should change the video system in the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1. The countermeasures against the malfunction of an automatic adjustment (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor) had been described there.

Tools List

To perform the RF system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A) (for the extension of DM-89 board)
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tapes for DNW-A65:
  SR5-1 (Part No. 8-960-075-01),
  CR5-1B (Part No. 8-960-096-41), and
  CR5-2A (Part No. 8-960-097-44)
- Alignment tapes for DNW-A65P:
  SR5-1P (Part No. 8-960-075-51),
  CR5-1B PS (Part No. 8-960-096-91), and
  CR5-2A PS (Part No. 8-960-098-44)

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
2-6-2	Betacam SX format overall RF system adjustment		A17 : A11-A16 ALL ADJUST	(Automatic adjustments)
		Data save	A1F : NV-RAM CONTROL	
2-6-3	Betacam / Betacam SP format PB system (EQ RF output level) adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Data save	A3F : NV-RAM CONTROL	

2-6-2. Betacam SX Format Overall RF System Adjustment

Preparing tools

- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tape

  For DNW-A65: SR5-1 (Part No. 8-960-075-01)
  For DNW-A65P: SR5-1P (Part No. 8-960-075-51)

Preparation

1. Clean the video heads.

(Refer to "5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning" of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

2. Check the setting of the sub control panel.

CHARACTER switch ⇨ ON

3. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Notice on the automatic adjustment

- Be sure not to touch the search dial and buttons which have an effect on tape running during the automatic adjustment mode. If tape running condition is changed, optimum adjustment can not be performed, the automatic adjustment operation may freeze, or the result of automatic adjustment become "FAIL" or "NG".
- If the adjustment with the automatic adjustment mode does not complete properly (an error message "Auto Adjust Failure" or "Condition NG" will be displayed on the video monitor), refer to "For Condition NG / Automatic Adjustment Failure" in Section 4-2-9 of the maintenance manual part 1.

Overall RF System Adjustment

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.

PB system adjustment

3. Enter A17 : A11-A16 ALL ADJUST in the maintenance mode.
   - Message "Auto Adjust (Push SET)" is displayed on the video monitor.
4. To execute the automatic adjustments for PB system, press the SET button once on the lower control panel.
   - Message "Auto Adjust Complete" is displayed on the video monitor when this adjustment is completed normally.
5. To exit the maintenance mode, press the MENU button four times.
6. Eject the alignment tape.

Data save (Store the adjusted data)

Note

Do not save the adjustment data if the automatic adjustments was not completed normally.

7. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
8. Enter A1F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
9. To exit the maintenance mode, press the MENU button four times.

2-6-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

After turning off the power, remove the DM-89 board.

2. Check the setting of the sub control panel.

CHARACTER switch ⇨ ON

3. Check the video system.

Check that the operation system is setting as follows:
DNW-A65: 525/60 system
DNW-A65P: 625/50 system
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

How to change the data

(1) Set the ∗ mark on the video monitor to the line to be changed the data by turning the search dial.
(In the time data display area of the VTR, display the item by turning it, “RF G M-Y-A” for example.)
(2) To change the data, turn the search dial with the JOG button pressing.

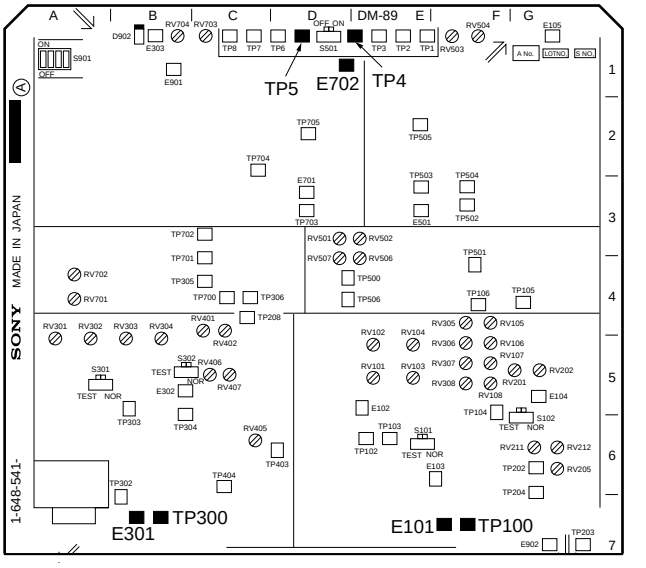
1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A3 : BETACAM PB ADJUST in the maintenance mode.
3. Enter A30 : EQ VR.

When the EQ-75 board or NV-RAM (IC900/EQ-75 board) was replaced, perform step 4.

4. Set the following initial data to all the items of A30 : EQ VR.
   DNW-A65: Data on 525/60 column
   DNW-A65P: Data on 625/50 column

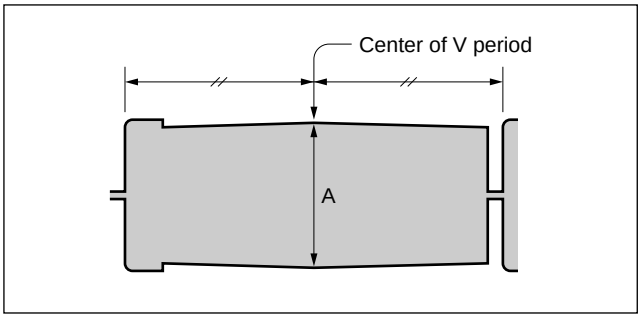
Item (A30 : EQ VR)	Initial data 525/60	625/50
RF GAIN METAL-Y-A	48	80
RF GAIN METAL-Y-B	48	80
RF GAIN METAL-C-A	48	80
RF GAIN METAL-C-B	48	80
RF GAIN OXIDE-Y-A	48	80
RF GAIN OXIDE-Y-B	48	80
RF GAIN OXIDE-C-A	48	80
RF GAIN OXIDE-C-B	48	80



DM-89 Board (Side A)

2. METAL Y Adjustment

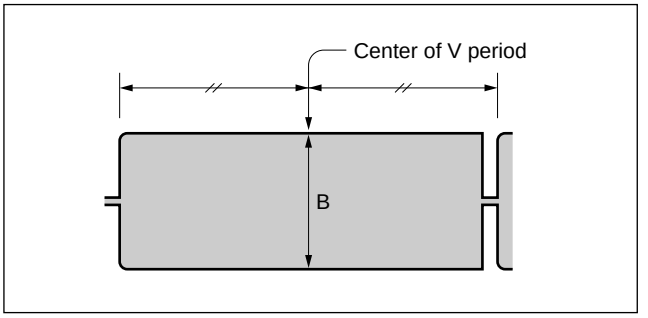
1. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   AC 100 mV/DIV
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   DC 1 V/DIV
   TIME: 2 ms/DIV
   TRIG: CH-2
2. To perform the tape operation, press the SET button once on the lower control panel.
3. Play back the flat field signal portion (24:00 to 26:00) of the following alignment tape in PLAY mode.
   For DNW-A65: CR5-1B
   For DNW-A65P: CR5-1B PS
4. To operate the maintenance mode, press the MENU button on the lower control panel.
5. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL Y-A (ch-A of METAL Y).
   Adj. point: A30 : EQ VR : RF GAIN METAL-Y-A
   Specification: A = 380 ±20 mV p-p
6. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL Y-B (ch-B of METAL Y).
   Adj. point: A30 : EQ VR : RF GAIN METAL-Y-B
   Specification: A = 380 ±20 mV p-p
7. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL Y-A and METAL Y-B until they are identical amplitude.



8. To perform the tape operation, press the SET button once.
9. Stop the playback of the alignment tape.

3. METAL C Adjustment

1. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
   CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. Play back the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B / CR5-1B PS in PLAY mode.
3. To operate the maintenance mode, press the MENU button once.
4. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL C-A (ch-A of METAL C).
   Adj. point: A30 : EQ VR : RF GAIN METAL-C-A
   Specification: B = 380 ±20 mV p-p
5. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL C-B (ch-B of METAL C).
   Adj. point: A30 : EQ VR : RF GAIN METAL-C-B
   Specification: B = 380 ±20 mV p-p
6. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL C-A and METAL C-B until they are identical amplitude.



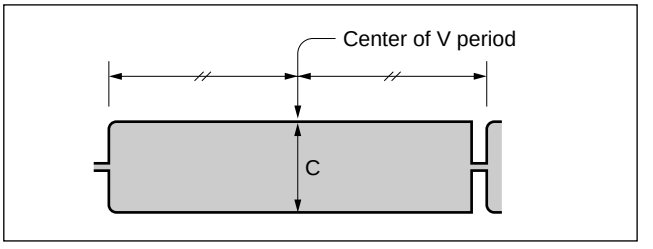
7. To perform the tape operation, press the SET button once.
8. Stop the playback of the alignment tape, then eject it.

4. OXIDE C Adjustment

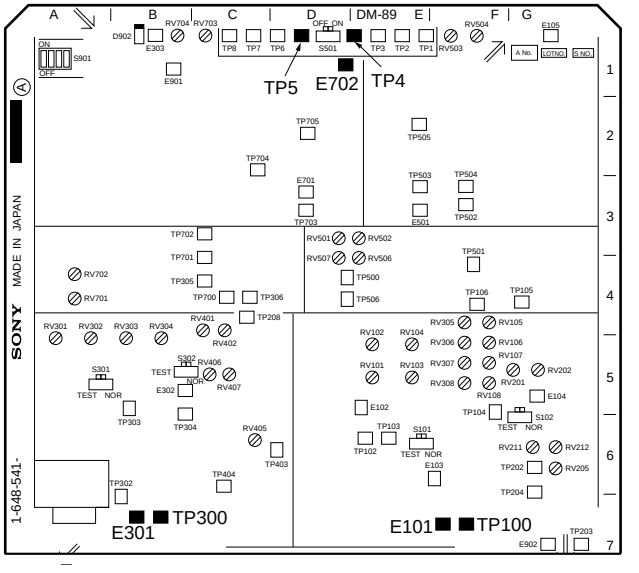
Note

The connections and settings of the oscilloscope are the same as “METAL C Adjustment”.

1. Play back the 75% color-bar signal portion (0:00 to 3:00) of the following alignment tape in PLAY mode.
   For DNW-A65: CR5-2A
   For DNW-A65P: CR5-2A PS
2. To operate the maintenance mode, press the MENU button once.
3. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE C-A (ch-A of OXIDE C).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE C-A
   Specification: C = 250 ± 20 mV p-p
4. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE C-B (ch-B of OXIDE C).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE C-B
   Specification: C = 250 ± 20 mV p-p
5. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE C-A and OXIDE C-B until they are identical amplitude.



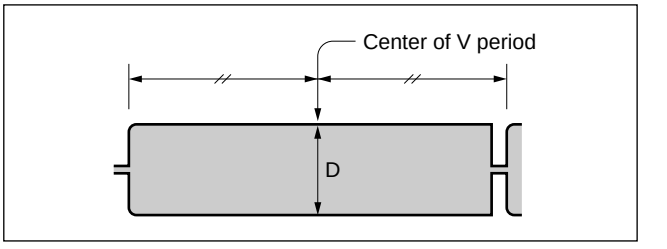
6. To perform the tape operation, press the SET button once.
7. Stop the playback of the alignment tape.



DM-89 Board (Side A)

5. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
   CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
2. Play back the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A / CR5-2A PS in PLAY mode.
3. To operate the maintenance mode, press the MENU button once.
4. Set the oscilloscope’s trigger to the − slope, then adjust the level of OXIDE Y-A (ch-A of OXIDE Y).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-A
   Specification: D = 250 ± 20 mV p-p
5. Set the oscilloscope’s trigger to the + slope, then adjust the level of OXIDE Y-B (ch-B of OXIDE Y).
   Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-B
   Specification: D = 250 ± 20 mV p-p
6. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the OXIDE Y-A and OXIDE Y-B until they are identical amplitude



7. To perform the tape operation, press the SET button once.
8. Stop the playback of the alignment tape, then eject it.
9. To operate the maintenance mode, press the MENU button once.
10. To exit A30 : EQ VR, press the MENU button once.

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6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.

2. To exit the maintenance mode, press the MENU button four times.

7. Initial Data Setting (Another Video System)

When the EQ-75 board or NV-RAM (IC900/EQ-75 board) was replaced only, be sure to perform as follows:

1. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.) And switch the video system of the video monitor.
   DNW-A65: 625/50 system (PAL)
   DNW-A65P: 525/60 system (NTSC)
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A3 : BETACAM PB ADJUST.
4. Set the following initial data to each item of the sub-menu (A30).
   DNW-A65: Data on 625/50 column
   DNW-A65P: Data on 525/60 column

Item (A30 : EQ VR)	Initial data 525/60	625/50
RF GAIN METAL-Y-A	48	80
RF GAIN METAL-Y-B	48	80
RF GAIN METAL-C-A	48	80
RF GAIN METAL-C-B	48	80
RF GAIN OXIDE-Y-A	48	80
RF GAIN OXIDE-Y-B	48	80
RF GAIN OXIDE-C-A	48	80
RF GAIN OXIDE-C-B	48	80

5. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
6. To exit the maintanance mode, press the MENU botton four times.
7. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the video monitor.
   DNW-A65: 525/60 system (NTSC)
   DNW-A65P: 625/50 system (PAL)

2-7. Audio System Adjustment

2-7-1. Adjustment Overview

In the audio system alignment for the VTR need to adjust the analog audio system only. For the digital audio system is not needed.

Tools List

To perform the audio system alignment for the VTR, prepare the following equipment and fixtures.

- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension boards: EX-555 (Part No. A-8277-211-A) and
  EX-556 (Part No. A-8277-212-A)
- Shorting clip
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41) and
  CR8-1A (Part No. 8-960-097-45)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91),
  CR8-1A PS (Part No. 8-960-098-45), and
  CR8-1B PS (Part No. 8-960-096-86)
- Composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Section	Item (Section title)		Adjustment point	Measurement point
2-7-3	Analog audio output (Line) adjustment (APR-40 board)			
	Output level adjustment	CH1	⊘RV500/APR-40	AUDIO OUTPUT CH1
		CH2	⊘RV600/APR-40	AUDIO OUTPUT CH2
		CH3	⊘RV700/APR-40	AUDIO OUTPUT CH3
		CH4	⊘RV800/APR-40	AUDIO OUTPUT CH4
		L	⊘RV900/APR-40	MONITOR OUTPUT L
		R	⊘RV1000/APR-40	MONITOR OUTPUT R
2-7-4	Analog audio offset adjustment (APR-40 board)			
	Offset level adjustment	CH1	⊘RV103/APR-40	TP1113/APR-40
		CH2	⊘RV203/APR-40	TP1113/APR-40
		CH3	⊘RV303/APR-40	TP1114/APR-40
		CH4	⊘RV403/APR-40	TP1114/APR-40
2-7-5	LAU PB line adjustment (AU-260 board)			
	LAU Dolby level pre-adjustment	CH1	⊘RV104/AU-260	TP103/AU-260
		CH2	⊘RV204/AU-260	TP203/AU-260
	LAU PB level pre-adjustment	CH2	⊘RV205/AU-260	AUDIO OUTPUT CH2
		CH1	⊘RV105/AU-260	AUDIO OUTPUT CH1
	LAU PB freq. response adj.	CH1	⊘RV101/AU-260, ⊘RV100/AU-260 (OXIDE) (S100/AU-260)	AUDIO OUTPUT CH1
		CH2	⊘RV201/AU-260, ⊘RV200/AU-260 (OXIDE) (S200/AU-260)	AUDIO OUTPUT CH2
		CH2	⊘RV202/AU-260 (METAL) for DNW-A65P only	AUDIO OUTPUT CH2
		CH1	⊘RV102/AU-260 (METAL) for DNW-A65P only	AUDIO OUTPUT CH1
	LAU Dolby level adjustment	CH1	⊘RV104/AU-260	TP103/AU-260
		CH2	⊘RV204/AU-260	TP203/AU-260
	LAU PB level adjustment	CH2	⊘RV205/AU-260	AUDIO OUTPUT CH2
		CH1	⊘RV105/AU-260	AUDIO OUTPUT CH1
	LAU PB phase adjustment		⊘RV203/AU-260	AUDIO OUTPUT CH1/CH2
2-7-6	AFM PB line adjustment (AU-260 board)			
	AFM RF level adjustment		⊘RV500/AU-260	TP570/AU-260 TP580/AU-260
	AFM VCO control voltage check		⊘LV500/AU-260	TP502/AU-260
	AFM demodulate balance check	CH3	⊘RV600/AU-260	AUDIO OUTPUT CH3
		CH4	⊘RV700/AU-260	AUDIO OUTPUT CH4
	AFM PB level adjustment	CH3	⊘RV601/AU-260	AUDIO OUTPUT CH3
		CH4	⊘RV701/AU-260	AUDIO OUTPUT CH4

Note

There are RV901, 902, 904, and 905 on the AU-260 board. But those are not used as the DNW-A65/A65P.
Therefore, do not have to adjust.

2-7-2. Common Preparation

Perform the settings (shorting plugs, control panels, setup menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the audio system alignment.

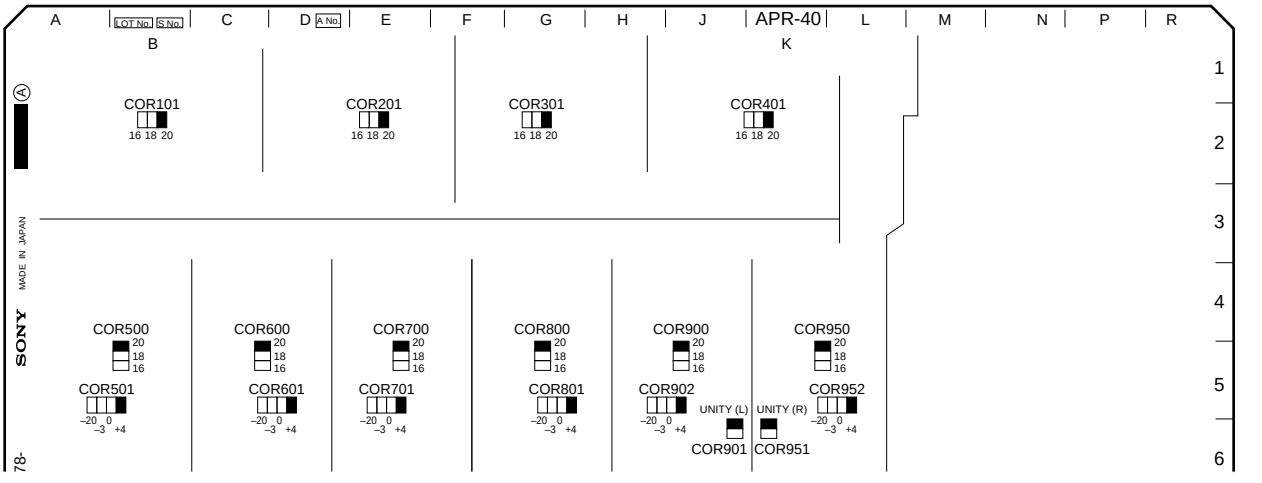
Shorting plugs setting

Reset the shorting plugs of APR-40 board to the factory settings.

Note

Turn off the power before removing the APR-40 board and changing the shorting plugs setting.

Ref. No. (Address)	Item	Customer setting	Factory setting
COR101 (B-2)	Analog audio CH1 input headroom	_____	⇨ 20
COR201 (E-2)	Analog audio CH2 input headroom	_____	⇨ 20
COR301 (G-2)	Analog audio CH3 input headroom	_____	⇨ 20
COR401 (K-2)	Analog audio CH4 input headroom	_____	⇨ 20
COR500 (B-5)	Analog audio CH1 output headroom	_____	⇨ 20
COR501 (B-5)	Analog audio CH1 output level	_____	⇨ +4
COR600 (C-5)	Analog audio CH2 output headroom	_____	⇨ 20
COR601 (D-5)	Analog audio CH2 output level	_____	⇨ +4
COR700 (E-5)	Analog audio CH3 output headroom	_____	⇨ 20
COR701 (E-5)	Analog audio CH3 output level	_____	⇨ +4
COR800 (G-5)	Analog audio CH4 output headroom	_____	⇨ 20
COR801 (G-5)	Analog audio CH4 output level	_____	⇨ +4
COR900 (J-5)	Monitor L output headroom	_____	⇨ 20
COR901 (J-5)	Monitor L output level, fixed or variable	_____	⇨ UNITY(L)
COR902 (H-5)	Monitor L output level	_____	⇨ +4
COR950 (K-5)	Monitor R output headroom	_____	⇨ 20
COR951 (K-5)	Monitor R output level, fixed or variable	_____	⇨ UNITY(R)
COR952 (K-5)	Monitor R output level	_____	⇨ +4



APR-40 Board (Side A)

2. Others settings

Location	Item		Customer setting	Setting at adjustment
SS-83 board	DIP switch S1100 (M-1)	No. 1	_____	⇨ ON (Set to the up position)
	Note Set to ON to treat the extended menu of the setup menu.			
Upper control panel	PB (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	REMOTE:	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	CHARACTER switch		_____	⇨ ON
	DOLBY NR switch		_____	⇨ OFF
	KEY INHIBIT switch		_____	⇨ OFF

3. Video system check

Be sure to adjust in the following system.
DNW-A65: 525/60 system
DNW-A65P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

4. Setup extended menu setting

Item	Customer setting	Setting at adjustment
817 : EMPHASIS	_____	⇨ OFF

2-7-3. Analog Audio Output Line Adjustment (APR-40 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio analyzer through the power for 20 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C23 : AUDIO TEST SG of the maintenance mode, select "1KHz SINE 0VU" as test signal.
3. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH1 adjustment

4. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
5. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV500/APR-40(B-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH2 adjustment

6. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV600/APR-40(C-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH3 adjustment

8. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
9. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV700/APR-40(F-5)
   Specification: +4.0 ±0.1 dBm (at 600 Ω load)

CH4 adjustment

10. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
11. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV800/APR-40(F-5)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

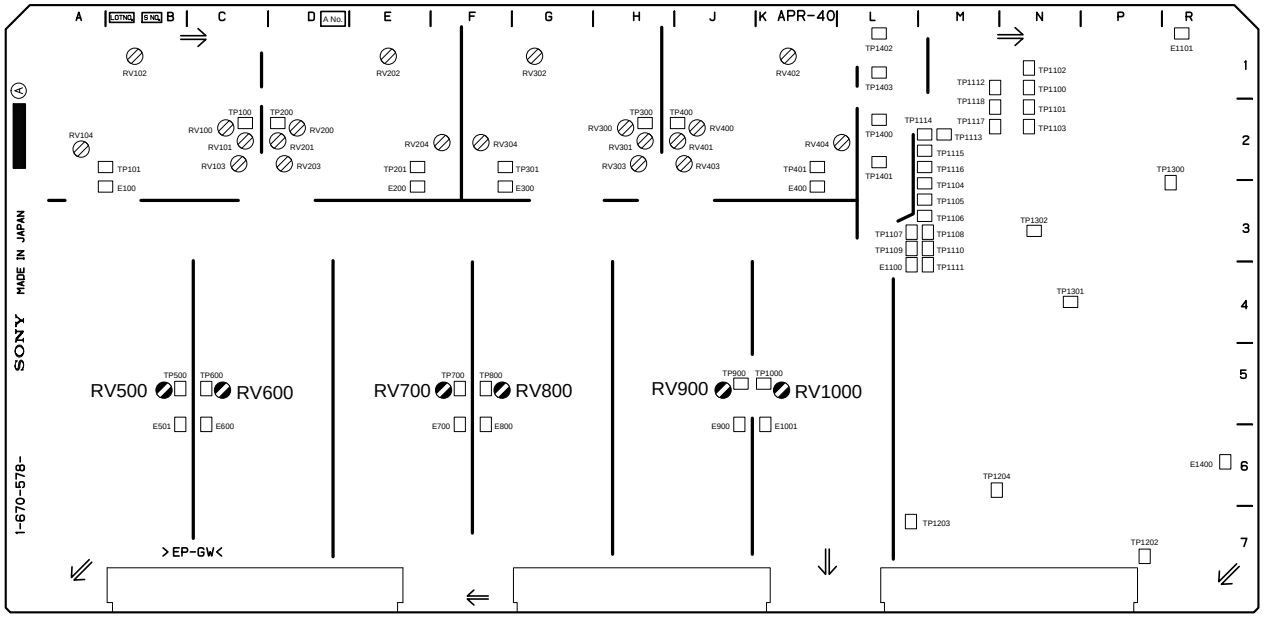
L channel adjustment

12. Connect the audio analyzer's input to MONITOR OUTPUT L connector.
13. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV900/APR-40(H-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

R channel adjustment

14. Connect the audio analyzer's input to MONITOR OUTPUT R connector.
15. Adjust the audio level on the audio analyzer.
    Adj. point: ⊘RV1000/APR-40(J-2)
    Specification: +4.0 ±0.1 dBm (at 600 Ω load)

16. To exit the maintenance mode, press the MENU button once.



APR-40 Board (Side A)

2-7-4. Analog Audio Offset Adjustment (APR-40 Board)

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Shorting clip

Preparation

1. Check that the shorting plug settings on the APR-40 board are factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the APR-40 board with an extension board EX-555.

Note

After turning off the power, remove the APR-40 board.

3. Check the settings on the upper control panel.

PB (audio level) controls: All CHs ⇨ PRESET

4. Check the setting of the setup extended menu.

ITEM-817 : EMPHASIS ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

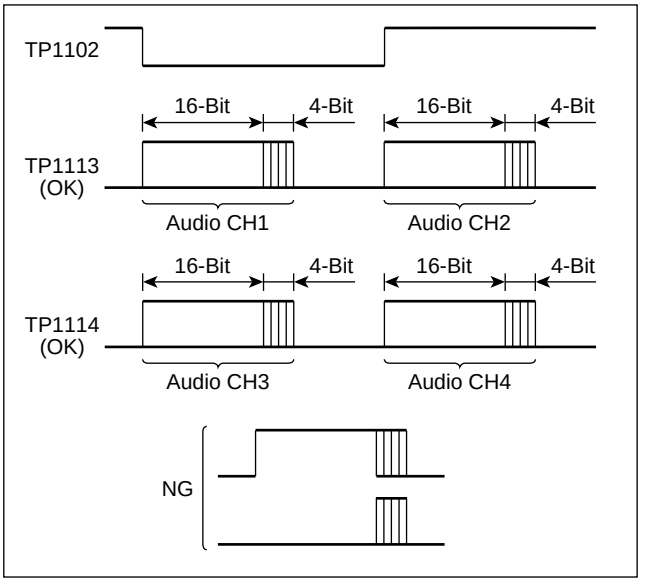


Figure 1. Waveform of Offset Level Adjustment

Offset Level Adjustment

CH1 adjustment

1. Short-circuit TP101(B-2) and E100(B-3) on the APR-40 board with a shorting clip.
2. Set and connect the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP1113/APR-40(M-2), DC 5 V/DIV
   GND: E1101/APR-40(R-1)
   CH-2: TP1102/APR-40(N-1), DC 5 V/DIV
   TIME: 2 μs/DIV
   TRIG: CH-2, − slope
3. Adjust so that audio CH1 part of the waveform at TP1113 makes the same waveform to the Figure 1 (left side).
   Adj. point: ⊘RV103/APR-40(C-2)
4. Remove the shorting clip on the APR-40 board.

CH2 adjustment

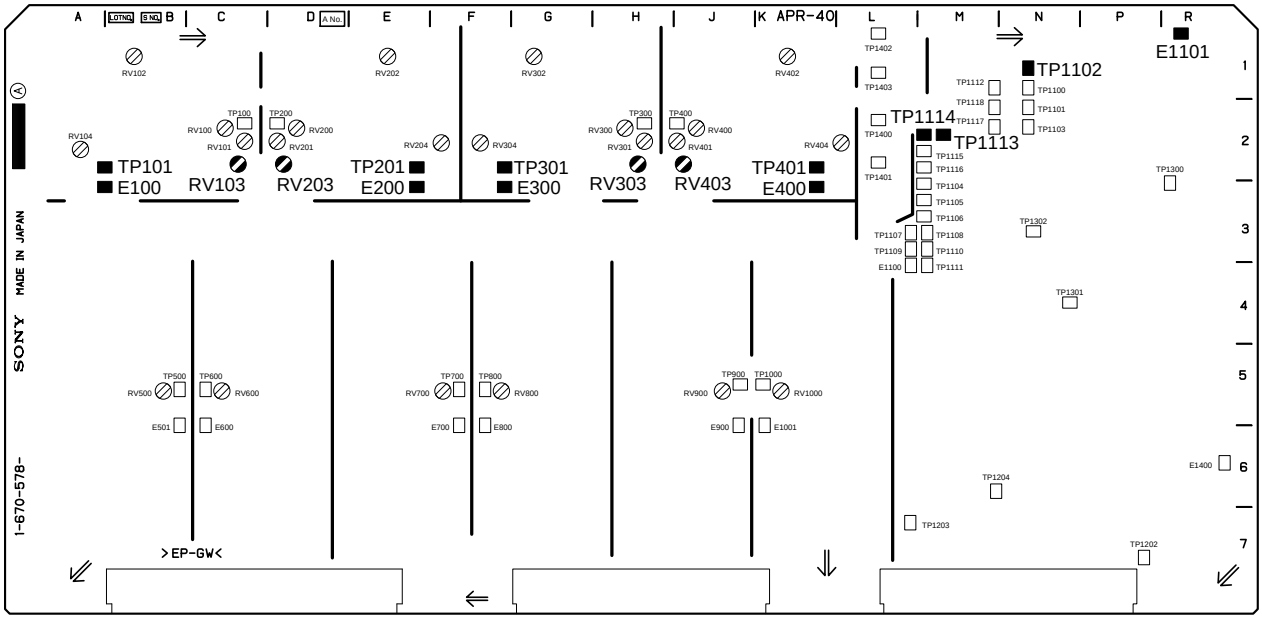
5. Short-circuit TP201(E-3) and E200(F-3) on the APR-40 board with a shorting clip.
6. Change the oscilloscope's trigger to the + slope.
7. Adjust so that audio CH2 part of the waveform at TP1113 makes the same waveform to the Figure 1 (right side).
   Adj. point: ⊘RV203/APR-40(D-2)
8. Remove the shorting clip on the APR-40 board.

CH3 adjustment

9. Short-circuit TP301(G-2) and E300(G-3) on the APR-40 board with a shorting clip.
10. Change the connection of the oscilloscope as follows:
    CH1: TP1114/APR-40(M-2)
11. Change the oscilloscope's trigger to the − slope.
12. Adjust so that audio CH3 part of the waveform at TP1114 makes the same waveform to the Figure 1 (left side).
    Adj. point: ⊘RV303/APR-40(H-2)
13. Remove the shorting clip on the APR-40 board.

CH4 adjustment

14. Short-circuit TP401(K-2) and E400(K-3) on the APR-40 board with a shorting clip.
15. Change the oscilloscope's trigger to the + slope.
16. Adjust so that audio CH4 part of the waveform at TP1114 makes the same waveform to the Figure 1 (right side).
    Adj. point: ⊘RV403/APR-40(J-2)
17. Remove the shorting clip on the APR-40 board.



APR-40 Board (Side A)

2-7-5. LAU PB Line Adjustment (AU-260 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Alignment tape(s)
  For DNW-A65: CR8-1A (Part No. 8-960-097-45)
  For DNW-A65P: CR8-1A PS (Part No. 8-960-098-45)
  and CR8-1B PS (Part No. 8-960-096-86)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to “Shorting plugs setting” in Section 2-7-2.)

2. Extend the AU-260 board with an extension board EX-556.

Note

After turning off the power, then remove the AU-260 board.

3. Clean the AT head.

Clean the tape running surface of the AT head. (Refer to “5-2-5. Stationary Heads Cleaning” of the maintenance manual part 1.)

Note

Perform the cleaning under the power off.

4. Check the settings on the upper control panel.

PB (audio level) controls: CH1 ⇨ PRESET
CH2 ⇨ PRESET
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

DOLBY NR switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

6. Check the video system.

Check that the operation system is setting as follows:
DNW-A65: 525/60 system
DNW-A65P: 625/50 system.
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

8. Check the setting of the setup extended menu.

ITEM-817 : EMPHASIS ⇨ OFF

9. Set the setup extend menu ITEM-F01 to “SW”. (For the DNW-A65P only)

Notes

- To display the ITEM-F00 series, turn the search dial with the PLAY button pressing.
- Return the ITEM-F01 : AUDIO NR IN SP MODE to “ON” after the LAU PB system adjustment are completed.

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1. LAU Dolby Pre-adjustment

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A65: CR8-1A
   For DNW-A65P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E200/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the alignment tape CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV204/AU-260(E-2)
   Specification: −10.0 ±0.5 dBu (0 dBu ≒ 0.775 V rms)

2. LAU PB Level Pre-adjustment

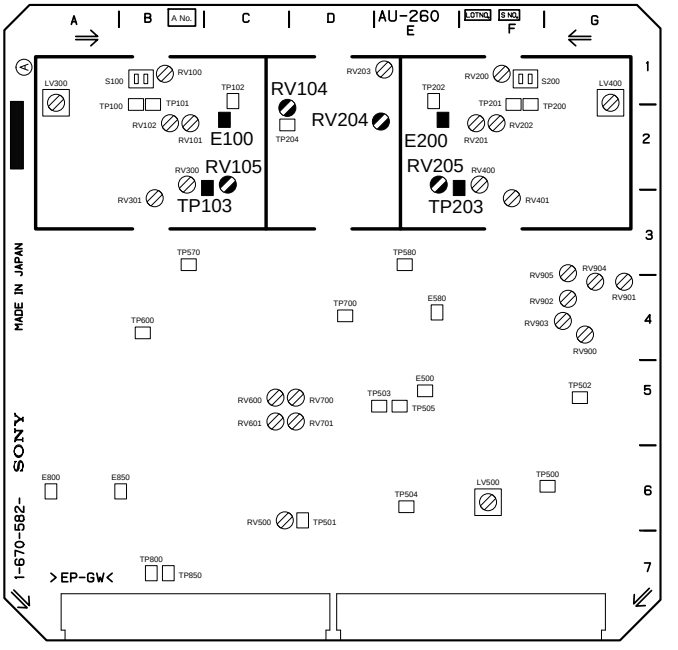
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A65: CR8-1A
   For DNW-A65P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV205/AU-260(E-2)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV105/AU-260(C-2)
   Specification: +4.0 ±0.5 dBm (at 600 Ω load)



AU-260 Board (Side A)

3. LAU PB Frequency Response Adjustment

1. Set the audio analyzer as follows:
   Function mode: dB RATIO
   Input filter: 80 kHz LPF

CH1 adjustment (OXIDE)

2. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
3. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the following alignment tape in PLAY mode, measure the audio level on the audio analyzer.
   For DNW-A65: CR8-1A
   For DNW-A65P: CR8-1A PS
   This measured audio level is a reference level (0 dB).
4. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV100 adjustment is not satisfied, readjust after changing the setting of S100(B-1) on the AU-260 board.

CH2 adjustment (OXIDE)

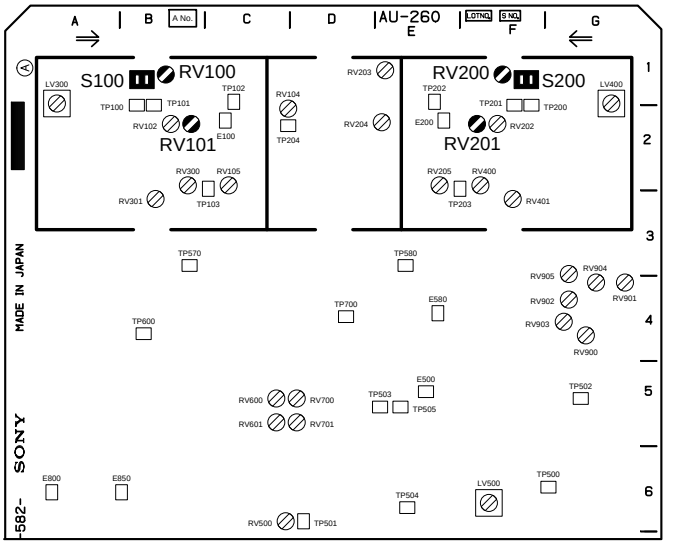
5. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
6. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
7. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

   Note

   If the specification for RV200 adjustment is not satisfied, readjust after changing the setting of S200(F-1) on the AU-260 board.

Playback portion	Specification [dB]		Adjustment point
	DNW-A65	DNW-A65P	
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).		—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	C.V. ±0.4	CH-1: ⊘RV101/AU-260 (B-2) CH-2: ⊘RV201/AU-260 (F-2)
7:00 to 7:25 (10 kHz)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{+1.0}_{-1.7}$	CH-1: ⊘RV100/AU-260 (B-1) CH-2: ⊘RV200/AU-260 (F-1)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

CH1 adjustment (METAL) for DNW-A65P only

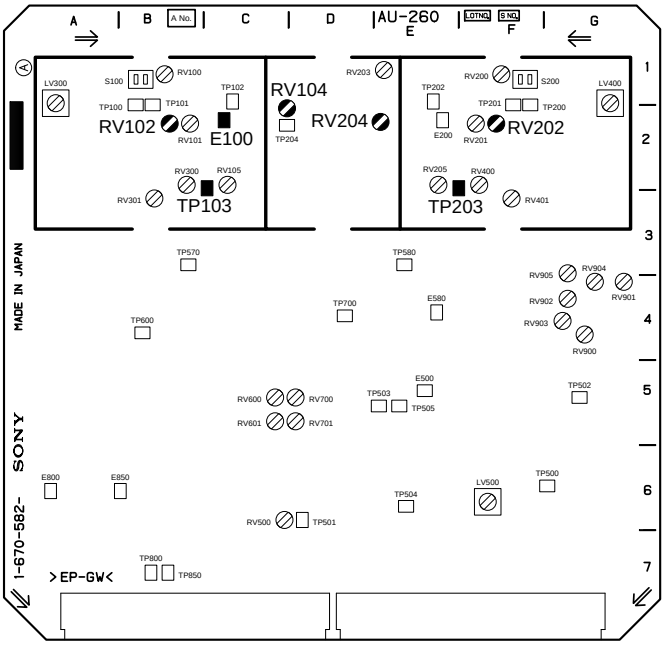
8. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
9. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the alignment tape CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer. This measured audio level is a reference level (0 dB).
10. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

CH2 adjustment (METAL) for DNW-A65P only

11. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
12. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer. This measured audio level is a reference level (0 dB).
13. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

Playback portion	Specification [dB]	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).	—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. ±0.5	CH-1: ⊘RV102/AU-260(B-2) CH-2: ⊘RV202/AU-260(F-2)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

4. LAU Dolby Level Adjustment

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A65: CR8-1A
   For DNW-A65P: CR8-1B PS
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E100/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV204/AU-260(E-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

5. LAU PB Level Adjustment

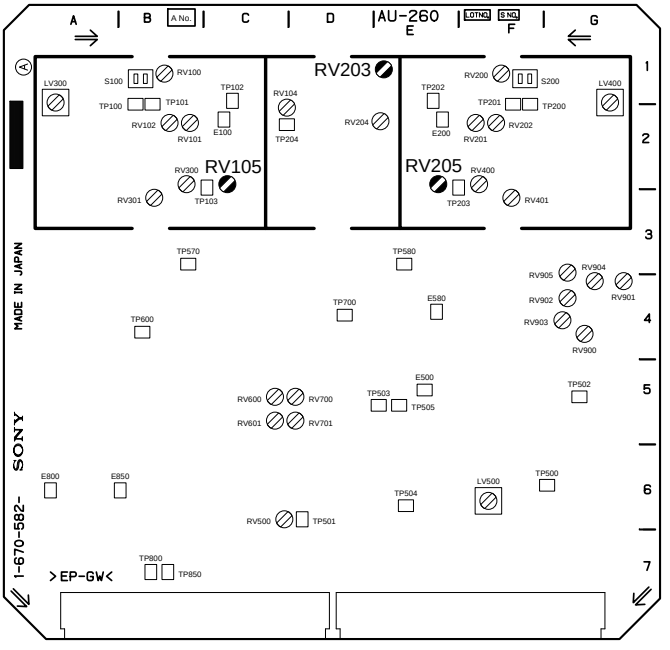
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
   For DNW-A65: CR8-1A
   For DNW-A65P: CR8-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV205/AU-260(E-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV105/AU-260(C-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

6. LAU PB Phase Adjustment

1. Connect and set the oscilloscope as follows:
   X-Y mode
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector
   GND: Pin 1 (G) of it, AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector
   GND: Pin 1 (G) of it, AC

   Note

   An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors.
   Prepare two XLR-to-pigtail cables for this adjustment. And connect the XLR plug end of the cable to above-mentioned connectors and the pigtailed end to the oscilloscope. The cables for CH-1 and CH-2 shall be the same in length and same wire color on the pigtailed end.
2. For DNW-A65: Play back the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A in PLAY mode.
   For DNW-A65P: Play back the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS in PLAY mode.
3. Watch the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adj. point: ⊘RV203/AU-260(E-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 2.)

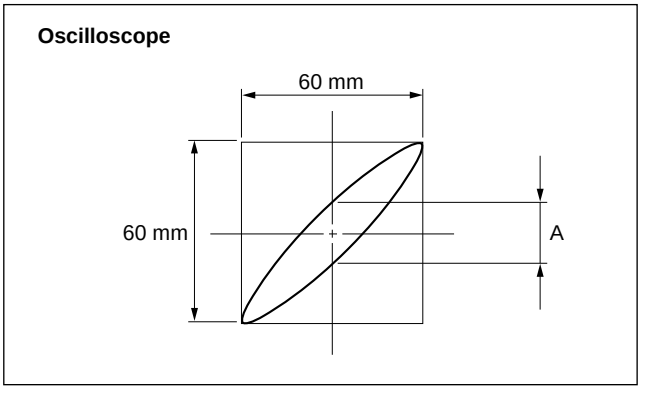


Figure 2. Lissajous Waveform of LAU PB Phase Adjustment

2-7-6. AFM PB Line Adjustment (AU-260 Board)

Preparing tools

- Audio analyzer:
  TEKTRONIX AA501A-option 02 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (Part No. A-8277-212-A)
- Cleaning tape: BCT-5CLN (Sony's standard products)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check that the shorting plug settings on the APR-40 board are the factory settings.

(Refer to "Shorting plugs setting" in Section 2-7-2.)

2. Extend the AU-260 board with an extension board EX-556.

Note

After turning off the power, then remove the AU-260 board.

3. Clean with the cleaning tape.

Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.

- The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.

4. Check the settings on the upper control panel.

PB (audio level) controls: CH3 ⇨ PRESET
CH4 ⇨ PRESET
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

DOLBY NR switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

6. Check the video system.

Check that the operation system is setting as follows:
DNW-A65: 525/60 system
DNW-A65P: 625/50 system.
If differed, change the video system in the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and equipment through the power for 20 minutes or more.

8. Check the setting of the setup extended menu.

ITEM-817 : EMPHASIS ⇨ OFF

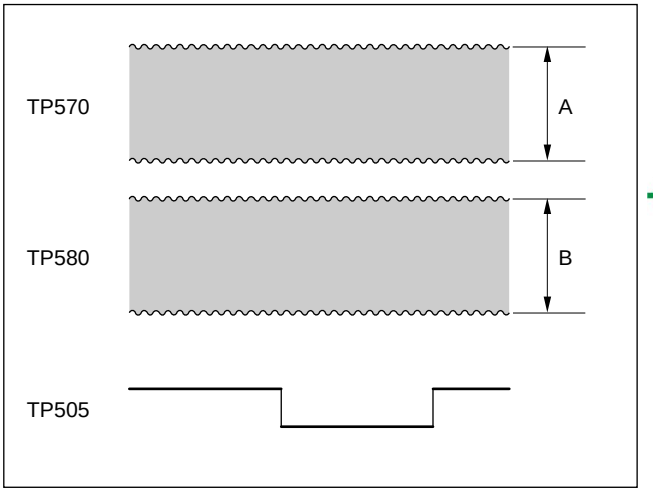
9. Set the setup extend menu ITEM-F01 to "SW". (For the DNW-A65P only)

Notes

- To display the ITEM-F00 series, turn the search dial with the PLAY button pressing.
- Return the ITEM-F01 : AUDIO NR IN SP MODE to "ON" after the LAU PB system adjustment are completed.

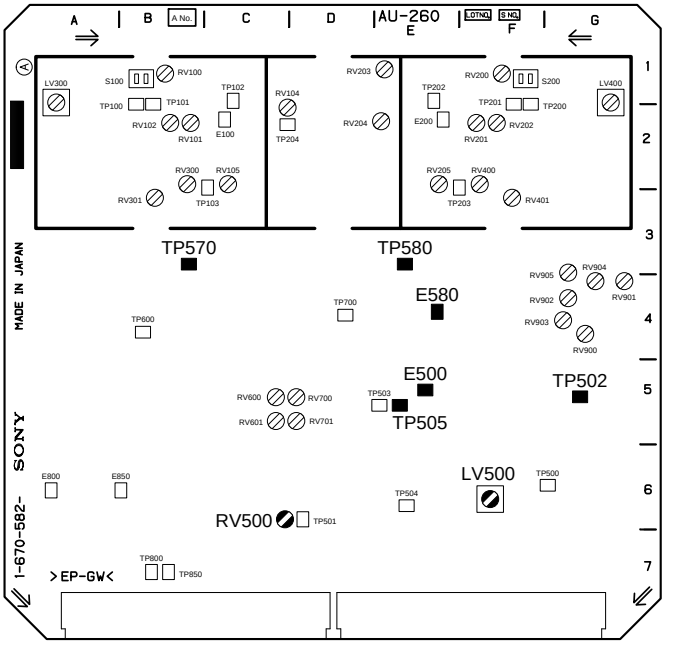
1. AFM RF Level Adjustment

1. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP570/AU-260(B-3), GND: E580/AU260(E-4)
   CH-2: TP580/AU-260(E-3), GND: E500/AU260(E-5)
   TRIG: TP505/AU-260(E-5), GND: E500/AU260(E-5)
   TIME: 5 ms/DIV
2. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the following alignment tape in PLAY mode.
   For DNW-A65: CR5-1B
   For DNW-A65P: CR5-1B PS
3. Check the RF levels of waveforms on the oscilloscope. If the speification is not satisfied, adjustment.
   Adj. point: ⊘RV500/AU-260(C-6)
   Specifications: A = 450 ±100 mV p-p
   B = 450 ±100 mV p-p



2. AFM VCO Control Voltage Check

1. Connect and set the oscilloscope as follows:
   CH-1: TP502/AU-260(G-5), GND: E580/AU260(E-4)
2. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
3. Check the DC level using the oscilloscope. If the specification is not satisfied, adjust it.
   Adj. point: ⊘LV500/AU-260(F-6)
   Specifications: 2.0 ±0.1 V p-p



AU-260 Board (Side A)

3. AFM Demodulate Balance Check

1. Set the audio analyzer as follows:
   Function mode: THD +N
   Range: 2 %
   Input filter: 80 kHz LPF

CH3 check

2. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
3. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
4. Check the distortion rate on the audio analyzer.
   Adj. point: ⊘RV600/AU-260(C-5)
   Specifications: Minimize (0.45 % or less: OK)

CH4 check

5. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
6. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
7. Check the distortion rate on the audio analyzer.
   Adj. point: ⊘RV700/AU-260(D-5)
   Specifications: Minimize (0.45 % or less: OK)

4. AFM PB Level Adjustment

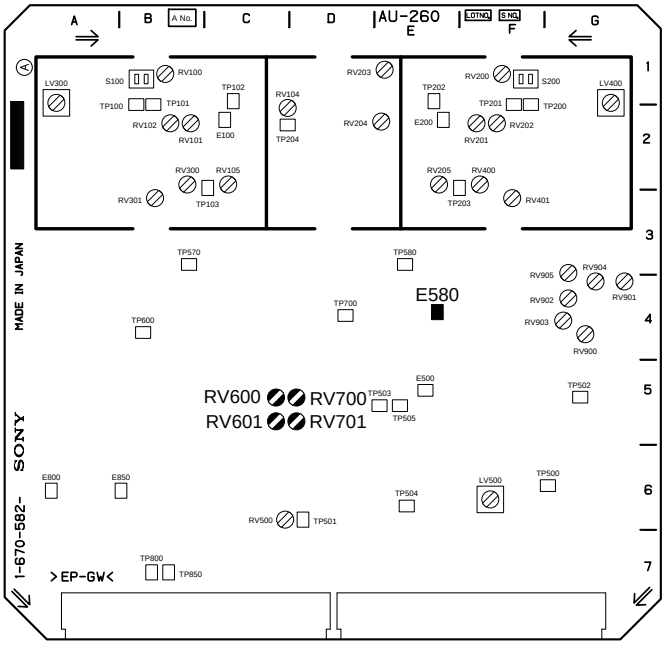
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH4 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH4 connector.
3. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the following alignment tape in PLAY mode.
   For DNW-A65: CR5-1B
   For DNW-A65P: CR5-1B PS
4. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV701/AU-260(D-5)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH3 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH3 connector.
6. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the CR5-1B or CR5-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ⊘RV601/AU-260(C-5)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

2-8. Video System Alignment (VPR-47 Board)

2-8-1. Adjustment Overview

Section 2-8 explains the alignment of the following in the video system.
- Reference signal system
- Video processing system
- Analog video output line

The adjustments are the manually adjustments using the menu of the maintenance mode.
When the VPR-47 board was replaced or repaired, perform the video system alignment.

Notes

- In the DNW-A65, be sure to adjust in 525/60 system before 625/50 system.
  In the DNW-A65P, be sure to adjust in 625/50 system before 525/60 system.
- In the video system alignment, be sure to adjust without the extension board.
- For the video system of the analog Betacam PB, refer to Section 2-11.

Note

For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

In Section 2-8, expresses the 525/60 and 625/50 systems as follows:

Video system	DNW-A65	DNW-A65P
525/60	Standard system	Another system
625/50	Another system	Standard system

Tools List

To perform the video system alignment for the VTR, prepare the following equipment and fixtures.

- Analog composite video signal generators (Sign is SG1.)
  - For 525/60 system: TEKTRONIX TSG-170A or equivalent
  - For 625/50 system: TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generators (Sign is SG2.)
  - For 525/60 system: TEKTRONIX 1410 or equivalent
  - For 625/50 system: TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitors
  - For 525/60 system: TEKTRONIX 1750, 1780R, or equivalent
  - For 625/50 system: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Analog composite video monitor (NTSC/PAL switchable type)

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)
- 75 Ω BNC T adapter

Adjustment Items

Section	Item		Adjustment point	Remarks
2-8-2	Preparation in standard system			DNW-A65: 525/60 system DNW-A65P: 625/50 system
2-8-3	Composite video output level adjustment			
		CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
		CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
		Data save	A2F : NV-RAM CONTROL	
2-8-4	Component video output adjustment			
		Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
		Output phase check		VIDEO OUTPUT COMPONENT
2-8-5	Component video output (Betacam) level adjustment			For 525/60 system only
		R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
2-8-6	Reference color frame pulse check			If the specification is not satisfied, change the adjustment data.
			A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
		Data save	A2F : NV-RAM CONTROL	
2-8-7	Internal 4fsc frequency adjustment			
			A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
		Data save	A2F : NV-RAM CONTROL	
2-8-8	Preparation in another system			DNW-A65: 625/50 system DNW-A65P: 525/60 system
2-8-9	Composite video output level adjustment			
		CH1/CH2	A20 : VPR VR : VIDEO 1/2 LEVEL	VIDEO OUTPUT COMPOSITE 1/2
		CH3	A20 : VPR VR : VIDEO 3 LEVEL	VIDEO OUTPUT COMPOSITE 3
		Data save	A2F : NV-RAM CONTROL	
2-8-10	Component video output adjustment			
		Y	A20 : VPR VR : Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT Y
		R-Y	A20 : VPR VR : R-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-Y OUTPUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
		Output phase check		VIDEO OUTPUT COMPONENT
2-8-11	Component video output (Betacam) level adjustment			For DNW-A65P only
		R-Y	A20 : VPR VR : B-CAM R-Y OUT LEVEL	VIDEO OUTPUT COMPONENT R-Y
		B-Y	A20 : VPR VR : B-CAM B-Y OUT LEVEL	VIDEO OUTPUT COMPONENT B-Y
		Data save	A2F : NV-RAM CONTROL	
2-7-12	Reference color frame pulse check			If the specification is not satisfied, change the adjustment data.
			A20 : VPR VR : REF 1st FLD DET	TP502/VPR-47(D-1)
		Data save	A2F : NV-RAM CONTROL	

Continue

Continued

Section	Item	Adjustment point	Remarks
2-8-13	Internal 4fsc frequency adjustment		
		A20 : VPR VR : INT 4Fsc FREQ	TP501/VPR-47(B-1)
	Data save	A2F : NV-RAM CONTROL	
2-8-14	Perfaction in video system alignment		

2-8-2. Preparation in Standard System

1. Set the VTR's switches as follows:

Location	Item	Customer setting		Setting at adjustment
SS-83 board	DIP switch S1100-1 (M-1) **Note** Set to ON to treat the extended menu of the setup menu.	_____	⇨	ON (Set to the up position)
Sub control panel	CHARACTER switch	_____	⇨	ON
	PROCESS CONTROL switch	_____	⇨	LOCAL
	• VIDEO switch	_____	⇨	PRESET
	• CHROMA switch	_____	⇨	PRESET
	• SET UP / BLACK LEVEL switch	_____	⇨	PRESET
	• Y/C DELAY switch	_____	⇨	PRESET
	• CHROMA PHASE switch	_____	⇨	PRESET
Connector panel	REF. VIDEO 75 Ω switch	_____	⇨	OFF (Set to the down position)

2. Set the following mode of the analog composite monitor.
   DNW-A65: NTSC
   DNW-A65P: PAL
3. Check that the video system is setting as follows:
   DNW-A65: 525/60 system
   DNW-A65P: 625/50 system
   If differed, change the video system in the setup menu ITEM-013 before adjusting.
   (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)
4. For the DNW-A65 only:
   Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No.	SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	_____	⇨	0.0%
	3. BETACAM PB LEVEL	_____	⇨	MSTER
	4. OUTPUT LEVEL	_____	⇨	MSTER

5. When extending the VPR-47 board with an extension board, stop the extending.
   Note
   If stopping the extension to the VPR-47 board, turn off the power, then remove the VPR-47 board.

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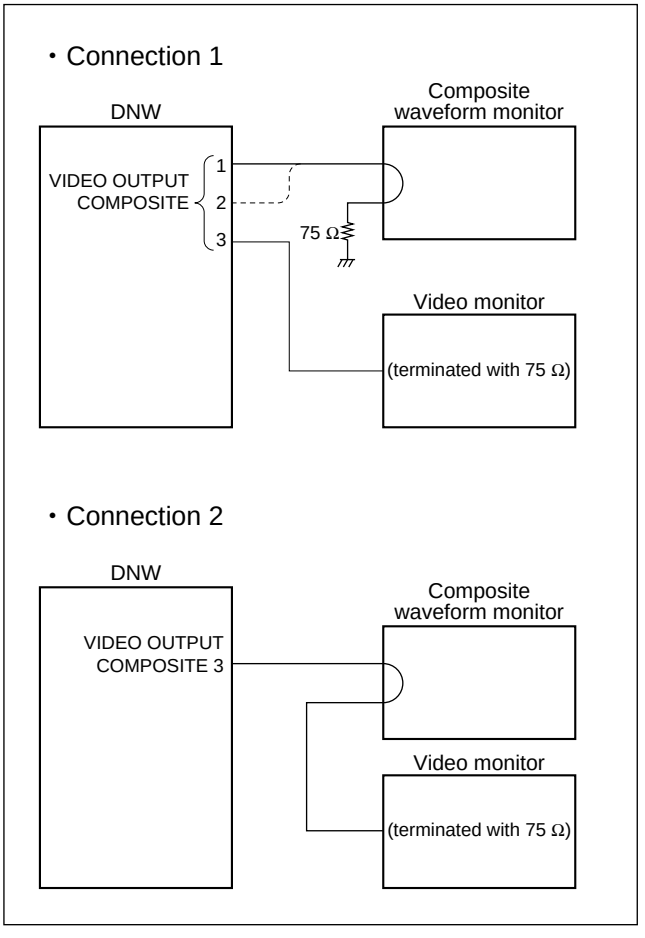
2-8-3. Composite Video Output Adjustment (Standard System)

Note

For the composite video output adjustment in the another system, refer to Section 2-8-9.

Preparing tools

- Analog composite waveform monitor
  For DNW-A65:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A65P:
  TEKTRONIX 1751, 1781R, or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite waveform monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A65 only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and composite waveform monitor through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A65: 75% Color Bars
   DNW-A65P: 100% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes
   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

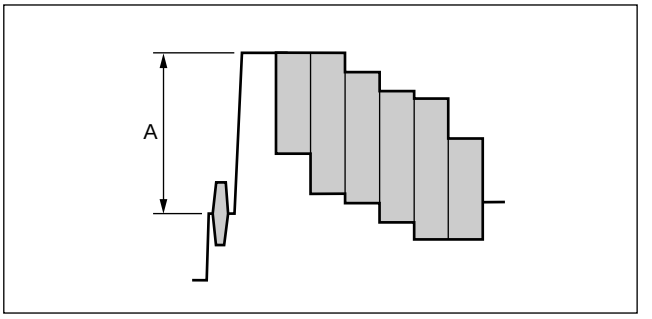
When the adjustment was not performed in step 5, skip over to step 9.

7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

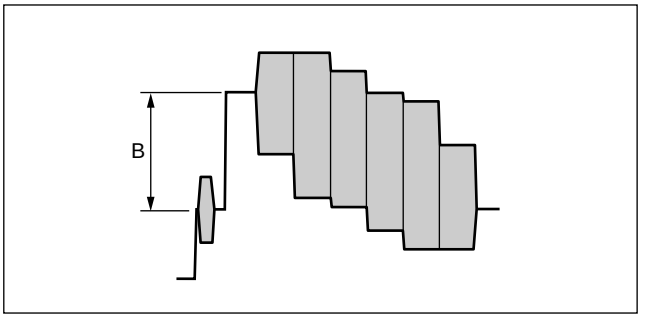
   Note
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

Output channel [Connection]	Adjustment point (A20 : VPR VR)	Specification DNW-A65	Specification DNW-A65P
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	A = 100 ±1 IRE	B = 700 ±7 mV
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL	(A = 714 ±7 mV)	
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A65 (525/60 System)



DNW-A65P (625/50 System)

2-8-4. Component Video Output Adjustment (Standard System)

Note

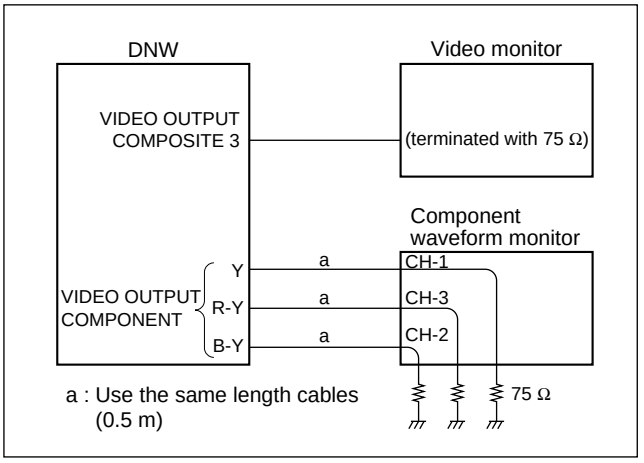
For the composite video output adjustment in the another system, refer to Section 2-8-10.

Preparing tools

- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  0. MASTER LEVEL ⇨ 0.0%
  4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

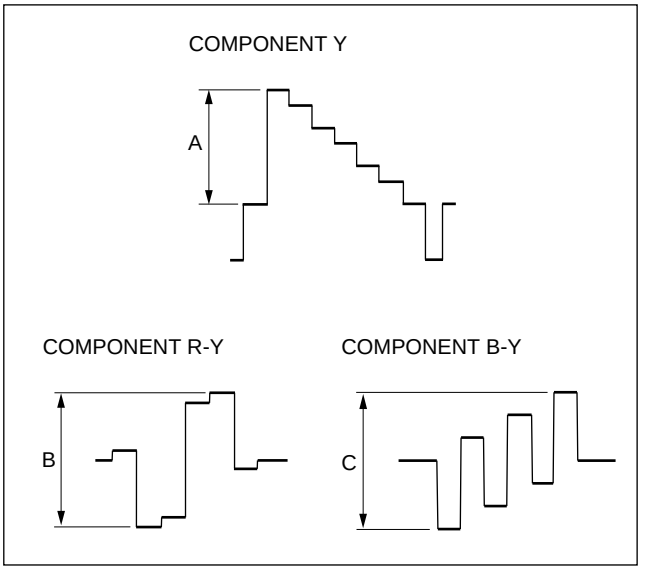
1. Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs on the waveform monitor. If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over steps 7 and 8.

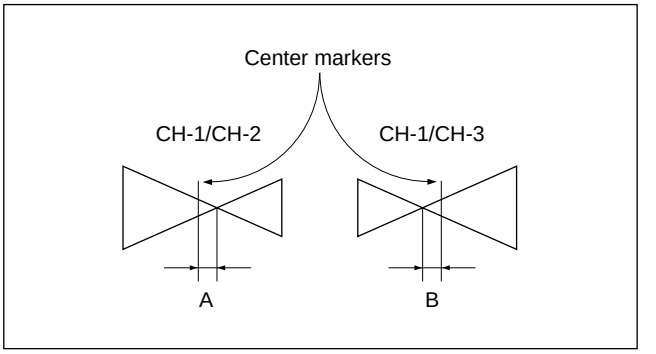
7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2. Output Phase Check

1. To exit the A2 : AUDIO/VIDEO ADJUST, press the MENU button once.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “Bowtie”.
3. Set the analog component waveform monitor to the BOWTIE mode.
4. Check the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Specifications: A = 0 ± 10 ns
   B = 0 ± 10 ns



5. To exit the maintenance mode, press the MENU button four times.

2-8-5. Component Video Output (Betacam) Adjustment (525/60 System)

Notes

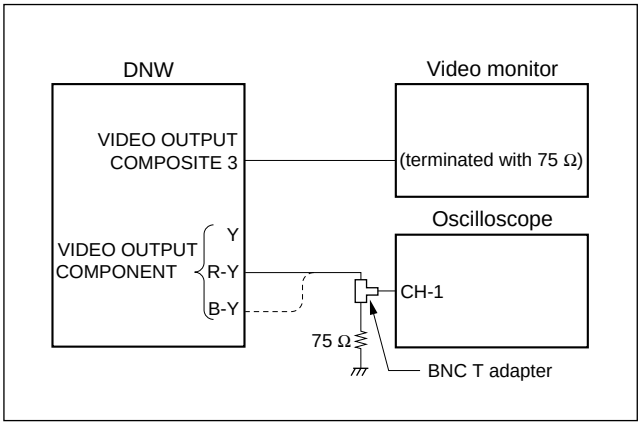
- Be sure to perform this adjustment when the VTR operates in the 525/60 system.
- For the DNW-A65P, be sure to perform this adjustment after Section 2-8-10 is completed.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- 75 Ω terminator
- 75 Ω BNC T adapter



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the oscilloscope as shown Figure "Connection".

4. Check the setup extend menu settings.

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MATER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

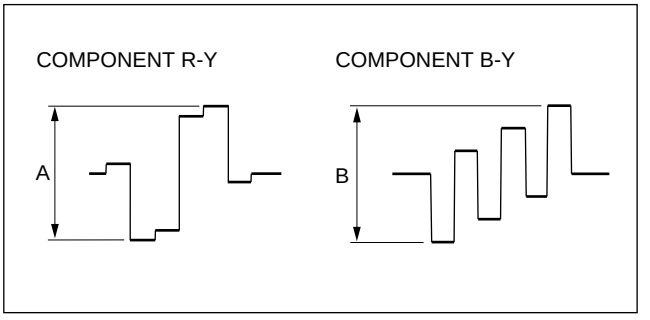
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “75% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: DC 100 mV/DIV
   TIME: 10 µs/DIV
   TRIG: CH-1
6. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT R-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : R-Y OUTPUT LEVEL
   Specification: A = 757 ±7 mV p-p
7. Connect the oscilloscope’s CH-1 input to VIDEO OUTPUT COMPONENT B-Y connector, then check the output level.
   If the specification is not satisfied, perform the adjustment.
   Adj. point: A20 : VPR VR : B-Y OUTPUT LEVEL
   Specification: B = 757 ±7 mV p-p



8. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in both step 6 and step 7, skip over to step 11.

9. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A2F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

2-8-6. Reference Color Frame Pulse Check (Standard System)

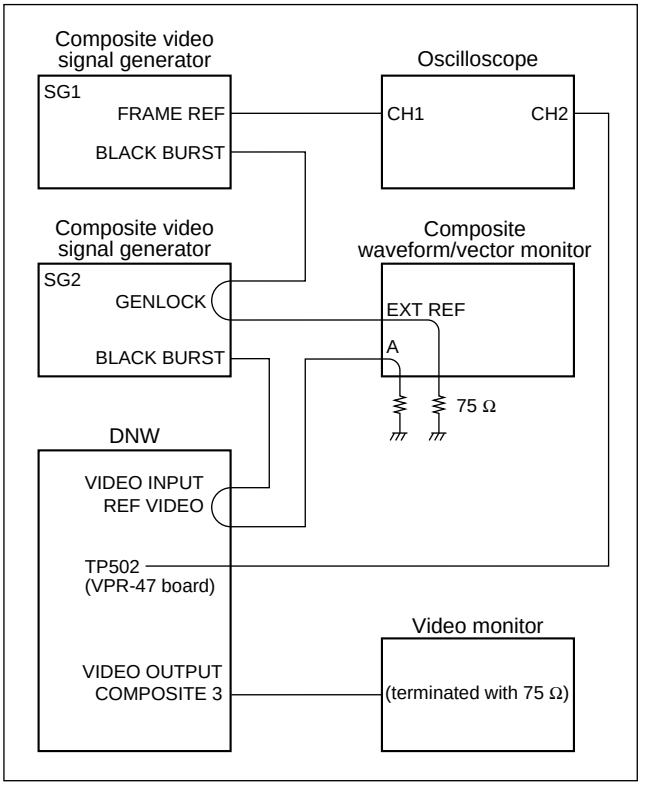
Note

For the reference color frame pulse check in another system, refer to Section 2-8-12.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A65:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A65P:
  TEKTRONIX TSG-271 or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A65: TEKTRONIX 1410 or equivalent
  For DNW-A65P: TEKTRONIX 1411 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A65:
  TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A65P:
  TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)

Connection



Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

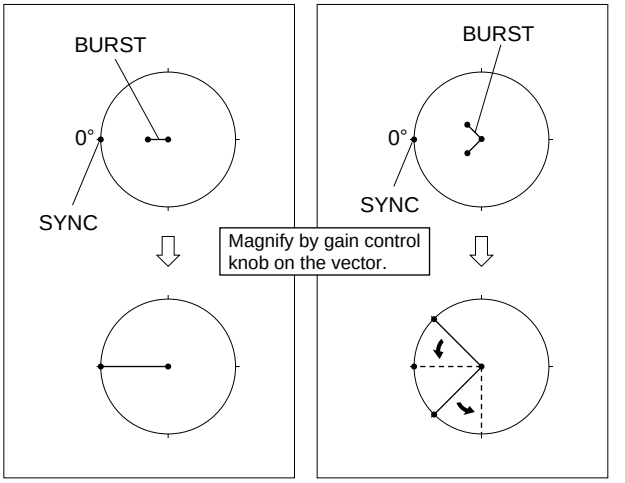
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

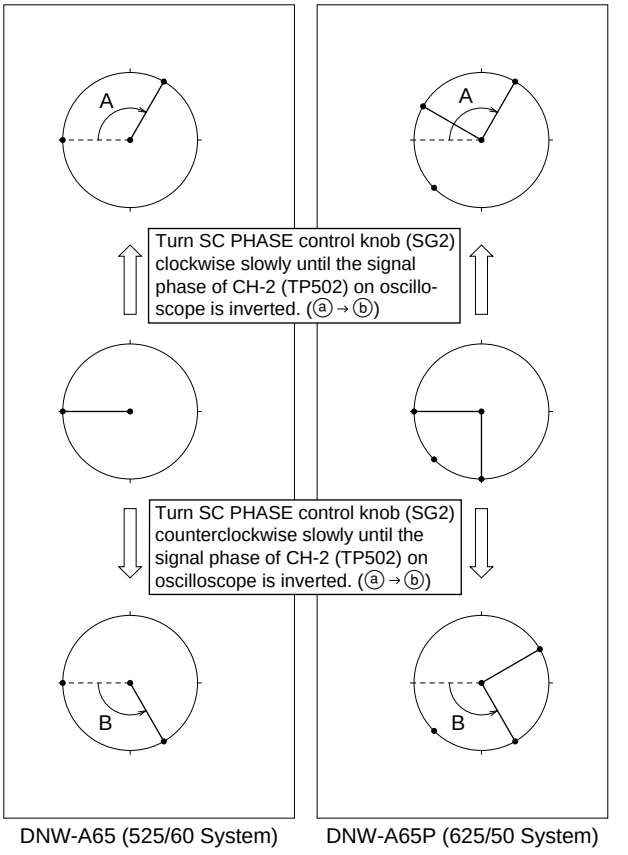
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-A65P only
   Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

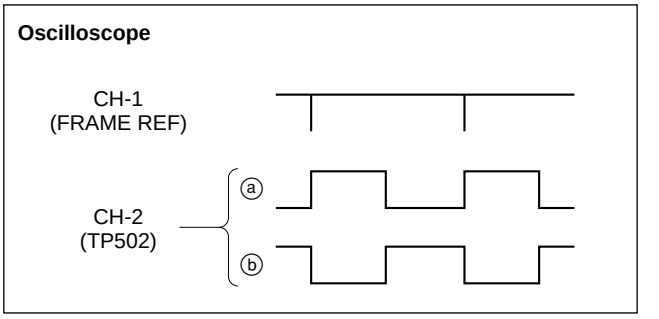


DNW-A65 (525/60 System) DNW-A65P (625/50 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20 : VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 10 ms/DIV for DNW-A65
   20 ms/DIV for DNW-A65P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: $A - B = 0 \pm 10^{\circ}$
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscillo-scope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-A65 (525/60 System)
DNW-A65P (625/50 System)



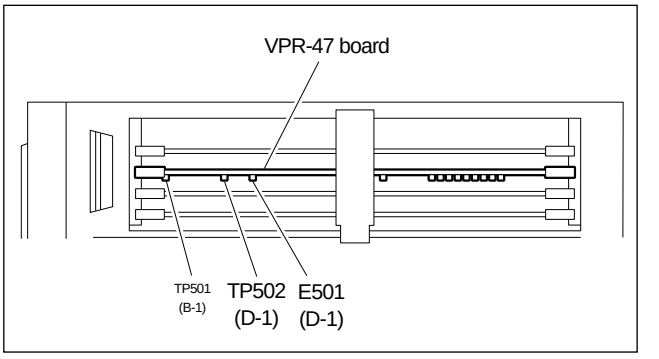
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2-8-7. Internal 4fsc Frequency Adjustment (Standard System)

Note

For the internal 4fsc frequency adjustment in another system, refer to Section 2-8-13.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification: 14,318,181 ±50 Hz for DNW-A65
   17,734,476 ±50 Hz for DNW-A65P
5. To exit A20: VPR VR, press the MENU button once.

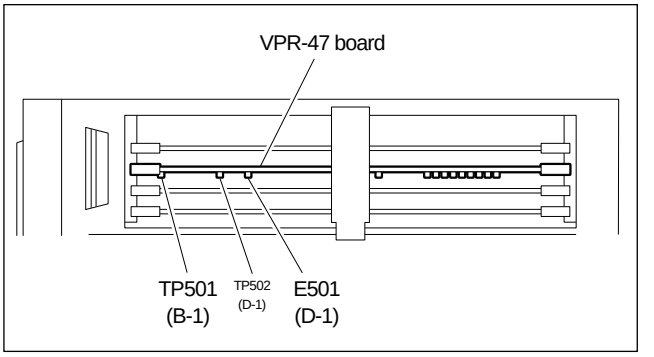
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



2-8-8. Preparation in Another System

Notes

- Be sure to perform the adjustments in the another system after completing the adjustments in the standard system.
- The settings of the VTR's switches are the same as the Preparation in standard system.

For the DNW-A65

1. Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-8-2.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Turn the video system to a 625/50 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.)
3. Set the analog composite monitor to the PAL mode.

For the DNW-A65P

1. Turn the video system to a 525/60 system using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.)
2. Set the analog composite monitor to the NTSC mode.
3. Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting		Setting at adjustment
709 : CAV LEVEL FORMAT			
1. OUTPUT CAV LEVEL	_____	⇨	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL			
0. MASTER LEVEL	_____	⇨	0.0%
3. BETACAM PB LEVEL	_____	⇨	MSTER
4. OUTPUT LEVEL	_____	⇨	MSTER

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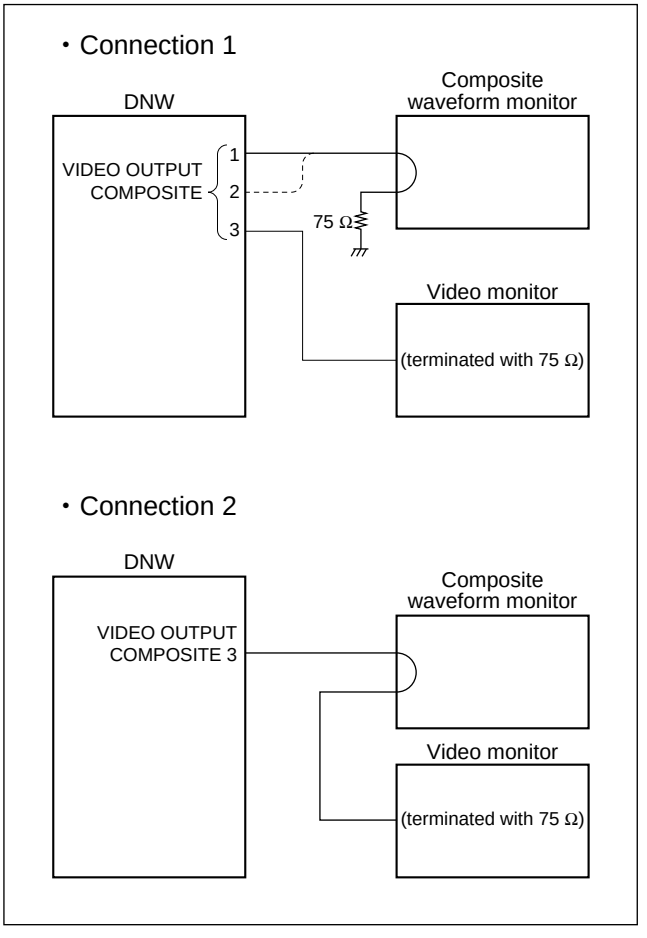
2-8-9. Composite Video Output Adjustment (Another System)

Note

For the composite video output adjustment in the standard system, refer to Section 2-8-3.

Preparing tools

- Analog composite waveform monitor
  For DNW-A65:
  TEKTRONIX 1751, 1781R or equivalent
  For DNW-A65P:
  TEKTRONIX 1750, 1780R or equivalent
- Analog composite video monitor
  Note
  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector otherwise note.
- 75 Ω terminator



Connections

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog composite monitor as shown Connection 1 on Figure "Connections".

4. Check the setup extend menu setting. (For the DNW-A65P only)
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 30 minutes or more.

Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the following test signal.
   DNW-A65: 100% Color Bars
   DNW-A65P: 75% Color Bars
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Connect the analog composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, then check the white peak level.
   If the specification is not satisfied, perform the adjustment.

   Notes

   - The outputs of VIDEO OUTPUT COMPOSITE 1 and 2 connectors cannot adjust separately.
   - When checking/adjusting the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector, change the connection of the video monitor as Connection 2 on the opposite page.
   - The menu picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 3 (SUPER) connector. If the superimposed picture obstructs, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after checking/adjusting.)

6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment in step 5 was not performed, skip over to step 9.

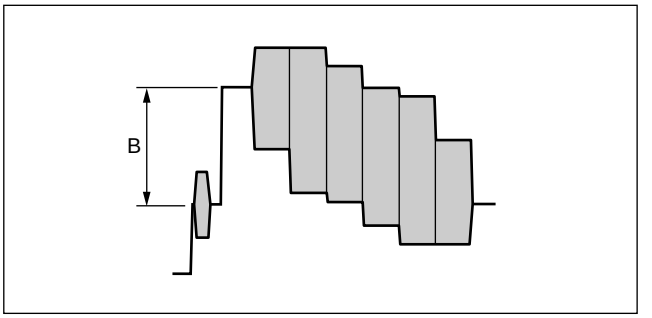
7. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

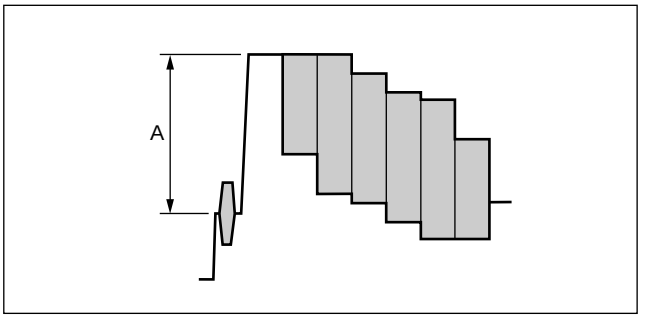
   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

	Adjustment point	Specification	
Output channel [Connection]	**(A20 : VPR VR)**	**DNW-A65**	**DNW-A65P**
COMPOSITE 1 [Connection 1]	VIDEO 1/2 LEVEL	B = 700 ±7 mV	A = 100 ±1 IRE
COMPOSITE 2 [Connection 1]	VIDEO 1/2 LEVEL		(A = 714 ±7 mV)
COMPOSITE 3 [Connection 2]	VIDEO 3 LEVEL		



DNW-A65 (625/50 System)



DNW-A65P (525/60 System)

2-8-10. Component Video Output Adjustment (Another System)

Note

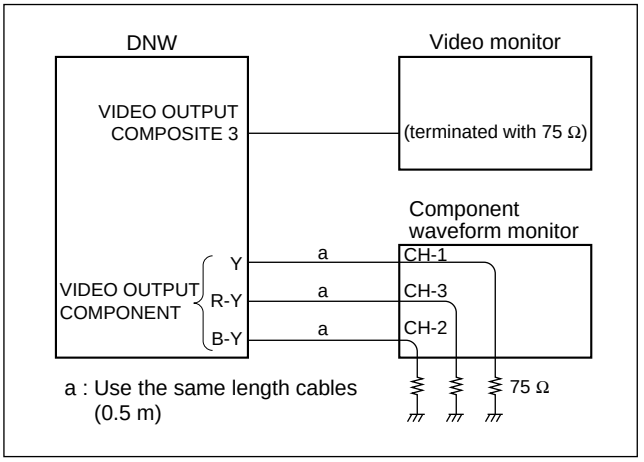
For the composite video output adjustment in the standard system, refer to Section 2-8-4.

Preparing tools

- Analog component waveform monitor
  TEKTRONIX WFM300 or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector on the connector panel.
- 75 Ω terminators (3 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1(M-1) switch ⇨ ON

2. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

3. Connect the analog component waveform monitor as shown Figure "Connection".

4. Check the setup extend menu settings. (For the DNW-A65P only)

ITEM-709 : CAV LEVEL FORMAT
  1. OUTPUT CAV LEVEL ⇨ D-1
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
  0. MASTER LEVEL ⇨ 0.0%
  4. OUTPUT LEVEL ⇨ MSTER

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and component waveform monitor through the power for 30 minutes or more.

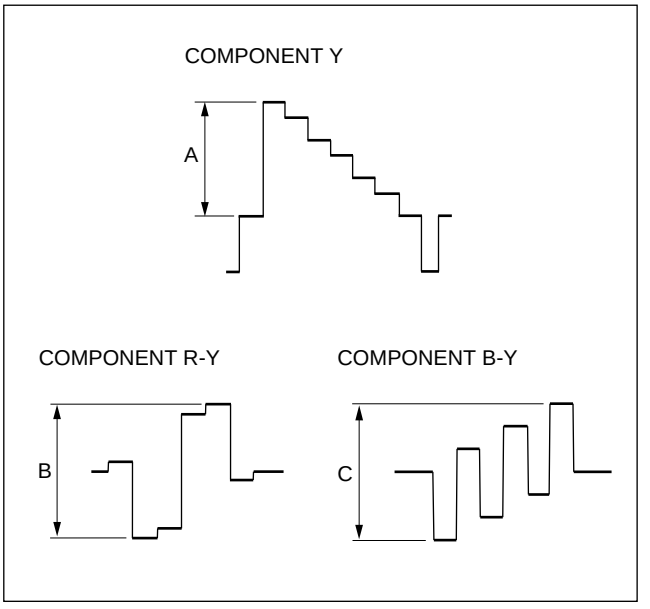
Output Level Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. In C21 : VIDEO TEST SG of the maintenance mode, select the test signal “100% Color Bars”.
3. To exit the C2 : AUDIO/VIDEO CHECK, press the MENU button two times.
4. Enter A20 : VPR VR.

Check (Adjustment)

5. Check each specified part’s level of VIDEO OUTPUT COMPONENT outputs (Y/R-Y/B-Y) on the waveform monitor.
   If the specification is not satisfied, perform the adjustment.

Output	Adj. point (A20 : VPR VR)	Specification
Y	Y OUTPUT LEVEL	A = 700 ±7 mV
R-Y	R-Y OUTPUT LEVEL	B = 700 ±7 mV p-p
B-Y	B-Y OUTPUT LEVEL	C = 700 ±7 mV p-p



6. To exit A20 : VPR VR, press the MENU button once.

Data save (Store the adjusted data)

When the adjustment was not performed in step 5, skip over to step 9.

7. Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
8. To exit A2F : NV-RAM CONTROL, press the MENU button once.

9. To exit the maintenance mode, press the MENU button three times.

2-8-11. Component Video Output (Betacam) Adjustment (for DNW-A65P only in 525/60 System)

For the component video output (Betacam) adjustment to DNW-A65P under 525/60 system, perform Section 2-8-5.

2-8-12. Reference Color Frame Pulse Check (Another System)

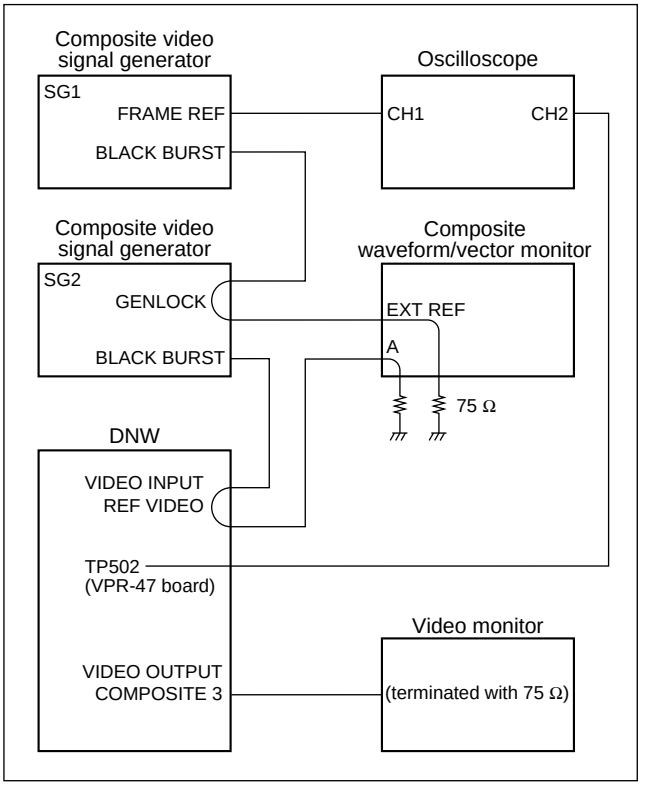
Note

For the reference color frame pulse check in standard system, refer to Section 2-8-6.

Preparing tools

- Analog composite video signal generator (Sign is SG1.)
  For DNW-A65:
  TEKTRONIX TSG-271 or equivalent
  For DNW-A65P:
  TEKTRONIX TSG-170A or equivalent
- Analog composite video signal generator (Sign is SG2.)
  For DNW-A65: TEKTRONIX 1411 or equivalent
  For DNW-A65P: TEKTRONIX 1410 or equivalent
- Analog composite waveform/vector monitor
  For DNW-A65:
  TEKTRONIX 1751, 1781R, or equivalent
  For DNW-A65P:
  TEKTRONIX 1750, 1780R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor
- 75 Ω terminators (2 pieces)

Connection



Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

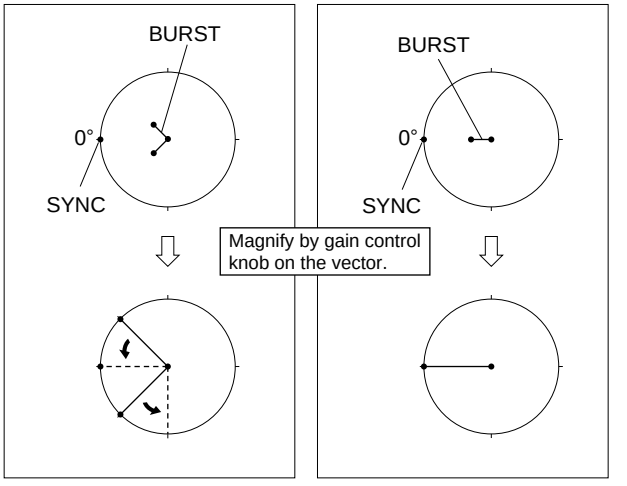
2. Connect the equipment as shown Figure "Connection".

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 30 minutes or more.

Setting of Composite Waveform/Vector Monitor

In this section, the analog composite waveform/vector monitor is abbreviated "vector" for short.

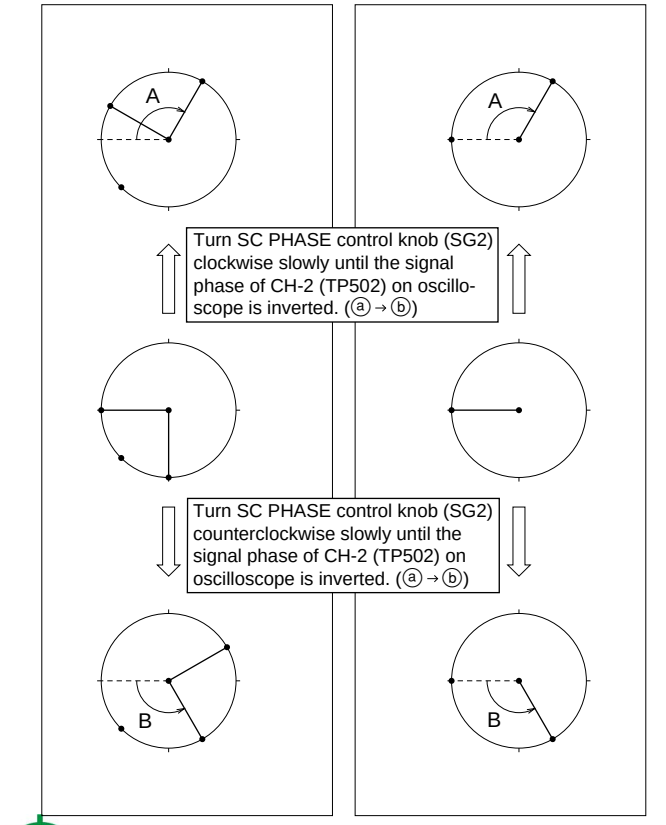
1. Set the vector as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Align the SYNC phase to 0 degree using the vector's PHASE knob so that the beam spot (SYNC) moves in the shortest route. (Refer to below figure.)
3. Align the BURST to regular potion on the vector using the signal generator SG2's SC PHASE knob.
4. Align the BURST's beam spot(s) to the circle scale on the vector using the gain control (knob) on the vector.
5. For DNW-A65 only: Align the BURST to the specified positions as the dotted lines of right figure using the vector's PHASE knob.

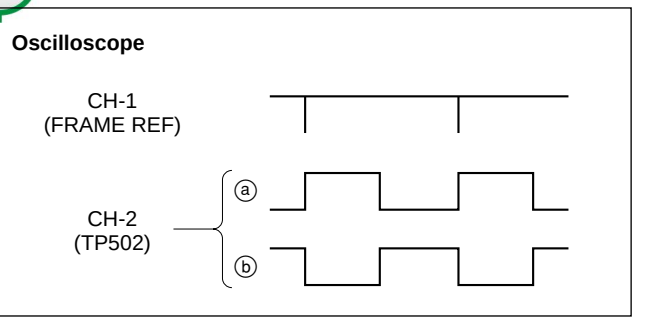


DNW-A65 (625/50 System) DNW-A65P (525/60 System)

Reference Color Frame Pulse Check

1. To enter the maintenace mode, press S1101(L-1) on the SS-83 board.
2. Enter A20 : VPR VR.
3. Connect and set the oscilloscope as follows:
   ALT display mode
   CH-2: TP502/VPR-47(D-1), DC 2 V/DIV
   GND: E501/VPR-47(D-1)
   TIME: 20 ms/DIV for DNW-A65
   10 ms/DIV for DNW-A65P
   TRIG: CH-1: DC 2 V/DIV
   (Connected SG2's FRAME REF output)
4. Turn the signal generator SG2's SC PHASE control knob clockwise (↻) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
5. Measure the BURST phase (angle A) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
6. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob counterclockwise (↺).
7. Turn the signal generator SG2's SC PHASE control knob counterclockwise (↺) slowly until the waveform of the oscilloscope's CH-2 (TP502) changes from ⓐ to ⓑ.
8. Measure the BURST phase (angle B) on the vector when just inverted the phase of CH-2 (TP502) on the oscilloscope.
9. To return the position of the BURST signal to be displayed on the vector, turn SG2's SC PHASE control knob clockwise (↻).
10. Confirm that the difference between the angles A and B is within specification.
    If the specification is not satisfied, perform steps (1) through (4).
    Specification: $A - B = 0 \pm 10°$
11. To exit the A20 : VPR VR, press the MENU button once.


A
A
Turn SC PHASE control knob (SG2) clockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
Turn SC PHASE control knob (SG2) counterclockwise slowly until the signal phase of CH-2 (TP502) on oscilloscope is inverted. (ⓐ→ⓑ)
B
B
DNW-A65 (625/50 System)
DNW-A65P (525/60 System)



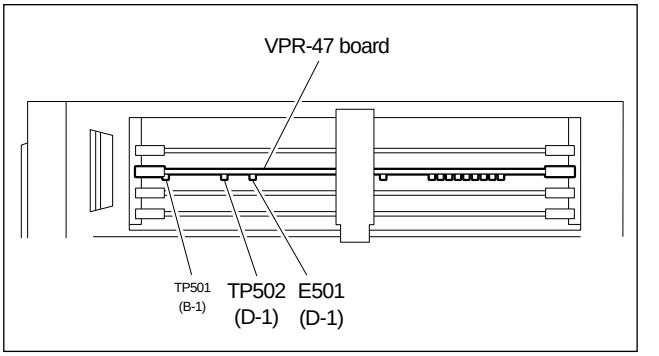
Perform following steps (1) and (2) when the specification in step 10 was not satisfied.

(1) Add/subtract 1 to/from the data value of "REF 1ST FLD DET".

Note

The data increase/decrease is dependent on the angles A and B measured in steps 5 and 8.
A > B : Subtract 1 from the data value.
A < B : Add 1 to the data value.

(2) Return to step 4.



Data save (Store the adjusted data)

Perform following steps 12 and 13 when the data of "REF 1ST FLD DET" in A20 : VPR VR was changed.

12. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
13. To exit A2F : NV-RAM CONTROL, press the MENU button once.

2-8-13. Internal 4fsc Frequency Adjustment (Another System)

Note

For the internal 4fsc frequency adjustment in standard system, refer to Section 2-8-7.

Preparing tools

- Frequency counter:
  ADVANTEST TR5821AK or equivalent
- Analog composite video monitor
  (NTSC/PAL switchable type)

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and frequency counter through the power for 30 minutes or more.button three times.

Frequency Adjustment

1. Supply no signal to REF. VIDEO connector. (or non connection)
2. Connect the frequency counter to TP501(B-1) on the VPR-47 board. GND: E501/VPR-47(D-1)
3. Enter A20 : VPR VR of the maintenance mode.
4. Adjust the frequency on the frequency counter.
   Adj. point: A20 : VPR VR : INT 4FSC FREQ
   Specification: 17,734,476 ±50 Hz for DNW-A65
   14,318,181 ±50 Hz for DNW-A65P
5. To exit A20 : VPR VR, press the MENU button once.

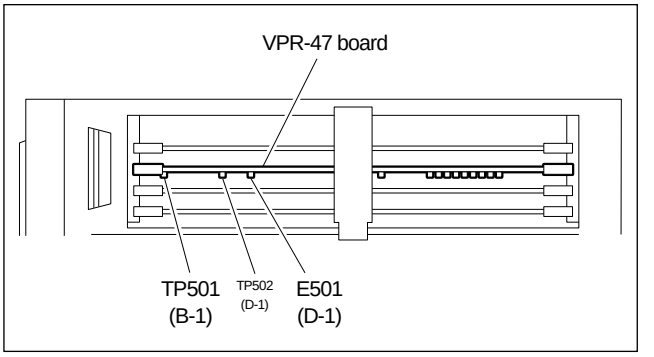
Data save (store the adjusted data)

6. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
7. To exit A2F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.



2-8-14. Perfection in Video System Alignment

1. For the DNW-A65P only
   Return the following SUB-ITEM settings of the ITEM-709 and -723 in the setup extend menu to the customer settings. (Refer to step 3 in Section 2-8-8.)
   - 709 : CAV LEVEL FORMAT
     1. OUTPUT CAV LEVEL
   - 713 : VIDEO SETUP REFERENCE LEVEL
     0. MASTER LEVEL
     3. BETACAM PB LEVEL
     4. OUTPUT LEVEL
2. Return the video system to the customer setting using the setup menu ITEM-013 : 525/625 SYSTEM SELECT.
   (Refer to Section 6-2-2 of the operation manual.)
3. Return the switch settings to the customer setting.
   (Refer to step 3 in Section 2-8-2.)

2-9. Reference Video Input Line Alignment

Alignment for the reference input line is included in the video system alignment.
Refer to Section 2-8.

2-10. Analog Betacam PB System Alignment

2-10-1. Adjustment Overview

Perform this section when aligning the video system in the analog Betacam PB system.
When aligning the audio system (LAU/AFM) in the analog Betacam PB system, refer to Section 2-7.

Note

For DNW-A65, be sure to adjust in the 525/60 system.
For DNW-A65P, be sure to adjust in the 625/50 system.
If differed, change the video system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

In this Section 2-10, perform the adjustments for the following boards. For adjustment items and its order, refer to "Adjustment Items" (next page).

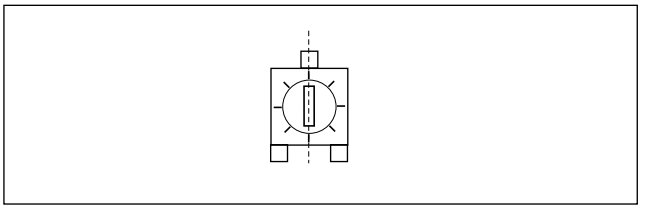
- DM-89 board
- EQ-56 board
- TBC-23A board
- TBC-24 board

However, the setting/check/adjustment for each board are as follows:

DM-89 board: Sections 2-10-2 to 2-10-19
TBC-23A board: Sections 2-10-2, 2-10-3, 2-10-24, 2-10-25, and 2-10-28
TBC-24 board: Sections 2-10-2, 2-10-29, and later

Notes

- When the EQ-56 board was replaced/repaired, refer to Section 2-6.
- As for RV202 on the TBC-24 board of board number suffixes 16 and higher for DNW-A65P use:
  If it is replaced or it is turned by mistake, set it to the mechanical center position as figure below. (This VR is for C A/D input linearity.)



Tools List

To perform the analog Betacam PB system alignment, prepare the following equipment and fixtures.

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

  Note

  It is required that the component video signal generator is able to output the 50% bowtie signal.
- Analog composite waveform/vector monitor
  For DNW-A65: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A65P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Network analyzer:
  ANRITSU MS420B or equivalent
- Digital voltmeter:
  ADVANTEST TR6845 or equivalent
- VISC phase adjustment tool (for DNW-A65P only)
  (Part No. J-6332-240-A)
- Analog component video monitor
  (NTSC/PAL switchable type)

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Cleaning tape: BCT-5CLN
  (SONY standard products)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Adjustment Items

No.	Item		Adjustment point	Remarks
2-10-3	Initial data setting	All data of A3 : BETACAM PB ADJUST		
2-10-4	EQ RF output level adjustment			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
		Data save	A3F : NV-RAM CONTROL	
2-10-5	Cosine equalizer adjustment			
	OMC DC offset		A35 : DM VR 4 : OMC DC METAL-Y	Set the data to E4.
			A35 : DM VR 4 : OMC DC METAL-C A35 : DM VR 4 : OMC DC OXIDE-Y A35 : DM VR 4 : OMC DC OXIDE-C	Set the data to D0.
	METAL Y	Group delay	⊘RV101/DM-89, ⊘RV102/DM-89	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-Y-A A33 : DM VR 2 : MAIN METAL-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-Y-A A34 : DM VR 3 : SUB METAL-Y-B	DNW-A65: Set the data B0. DNW-A65P: TP2/DM-89
	METAL C	Group delay	⊘RV301/DM-89, ⊘RV302/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN METAL-C-A A33 : DM VR 2 : MAIN METAL-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB METAL-C-A A34 : DM VR 3 : SUB METAL-C-B	DNW-A65: Set the data 70. DNW-A65P: TP6/DM-89
	OXIDE C	Group delay	⊘RV303/DM-89, ⊘RV304/DM-89	TP304/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-C-A A33 : DM VR 2 : MAIN OXIDE-C-B	TP7/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-C-A A34 : DM VR 3 : SUB OXIDE-C-B	TP6/DM-89
	OXIDE Y	Group delay	⊘RV104/DM-89, ⊘RV103/DM-89*1	TP104/DM-89
		Main	A33 : DM VR 2 : MAIN OXIDE-Y-A A33 : DM VR 2 : MAIN OXIDE-Y-B	TP3/DM-89
		Sub	A34 : DM VR 3 : SUB OXIDE-Y-A A34 : DM VR 3 : SUB OXIDE-Y-B	TP2/DM-89
	Data save		A3F : NV-RAM CONTROL	
2-10-6	Cosine equalizer provisional adjustment			

Note

This provisional adjustment explains how to adjust without using the network analyzer as opposed to adjustment (Section 2-10-5) using the network analyzer.
Perform this provisional adjustment only when the network analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 2-10-5) using the network analyzer at a later date.

*1: RV103 is not equipped on the DM-89 board of LOT Nos. 407 and higher.

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(Continued)

No.	Item		Adjustment point	Remarks
2-10-7	DM RF output level adjustment			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
2-10-8	OMC carrier balance adjustment			
		METAL Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
		METAL C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
		OXIDE C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
		OXIDE Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
2-10-9	OMC carrier balance provisional adjustment **Note** This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (Section 2-10-8) using the spectrum analyzer. Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 2-10-8) using the spectrum analyzer at a later date.			
2-10-10	Demodulator limiter balance adjustment			
		Y	⊘RV502/DM-89	TP501/DM-89
		C	⊘RV702/DM-89	TP8/DM-89
2-10-11	Non-liner output level adjustment			
		METAL Y	⊘RV503/DM-89	TP505/DM-89
		METAL C	⊘RV703/DM-89 (For DNW-A65P) ⊘RV704/DM-89 (For DNW-A65)	TP705/DM-89
		OXIDE C	⊘RV704/DM-89 (For DNW-A65P)	TP705/DM-89
		OXIDE Y	⊘RV504/DM-89	TP505/DM-89
2-10-12	PB frequency response adjustment			
		METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	
2-10-13	Drop-out compensation equalizer adjustment			
		METAL Y	⊘RV201/DM-89	TP203/DM-89
		METAL C	⊘RV401/DM-89	TP403/DM-89
		OXIDE Y	⊘RV202/DM-89	RV202/DM-89
		OXIDE C	⊘RV402/DM-89	RV402/DM-89

OMC: Over-Modulation Compensation circuit

(Continue)

(Continued)

No.	Item		Adjustment point	Remarks
2-10-14	DM RF output level readjustment			
		OXIDE C	⊘RV212/DM-89	TP3/DM-89
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE Y	⊘RV407/DM-89	TP7/DM-89
2-10-15	RF envelope adjustment			
		TH H level	A36 : DM VR 5 : ENV-TH-H	Set the data to 20.
		TH L level	A36 : DM VR 5 : ENV-TH-L	Set the data to 10.
		Data save	A3F : NV-RAM CONTROL	
		Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
2-10-16	DM search picture adjustment			
		Offset	⊘RV506/DM-89	TP500/DM-89
		Y	⊘RV501/DM-89	TP502/DM-89
		C	⊘RV701/DM-89	TP702/DM-89
		Gain	⊘RV507/DM-89	TP1/DM-89
2-10-17	Pairing check	METAL	—	Video monitor
		OXIDE	—	Video monitor
2-10-18	Guard band width adjustment			
		METAL	A35 : DM VR 4 : GUARD BAND M-Y A35 : DM VR 4 : GUARD BAND M-C	Video monitor
		OXIDE	A35 : DM VR 4 : GUARD BAND O-Y A35 : DM VR 4 : GUARD BAND O-C	Video monitor
		Data save	A3F : NV-RAM CONTROL	
2-10-19	Component output level adjustment			
		METAL Y	⊘RV101/TBC-24	VIDEO OUTPUT COMPONENT Y
		METAL C	⊘RV201/TBC-24	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	⊘RV504/DM-89	VIDEO OUTPUT COMPONENT Y
		OXIDE C	⊘RV704/DM-89 (For DNW-A65P)	VIDEO OUTPUT COMPONENT R-Y/B-Y
2-10-20	A/D clamp DC level adjustment			
		C	⊘RV202/TBC-24※2	TP202/TBC-24
		Y	⊘RV102/TBC-24※2	TP102/TBC-24
2-10-21	VCO lock-in range adjustment			
		Y	⊘RV404/TBC-24※2 ⊘LV401/TBC-24	RV404/TBC-24 TP403/TBC-24
		C	⊘RV604/TBC-24※2 ⊘LV601/TBC-24	RV604/TBC-24 TP603/TBC-24

(Continue)

※2: These VRs are equipped on the TBC-24 board of board number suffixes 11 and 12.

(Continued)

No.	Item		Adjustment point	Remarks
2-10-22	TBC VCO free-running adjustment*3			
		Y	⊘RV303/TBC-24	RV404/TBC-24 and Video monitor
		C	⊘RV503/TBC-24	Video monitor
2-10-23	FAST VCO tracking adjustment			
		Gain	⊘RV400/TBC-24*4	RV400/TBC-24
		Offset	⊘RV402/TBC-24*5 (For DNW-A65)	Video monitor
2-10-24	PB video phase adjustment		⊘RV300/TBC-24 A37 : TBC VR : SQ Y RZ*6	VIDEO OUTPUT COMPONENT Y
2-10-25	TBC Y/C delay rough adjustment			
		METAL	⊘RV502/TBC-24 ⊘RV503/TBC-24 ⊘RV500/TBC-24 A37 : TBC VR : SQ C RZ*7 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
2-10-26	Impact error offset adjustment			
		Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	Video monitor
2-10-27	TBC Y/C delay adjustment			
		METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24*8	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT
2-10-28	VISC phase adjustment		⊘RV200/TBC-23A A37 : TBC VR : VISC PHASE*9	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	

∗3: This adjustment is performed only if RV303 on the TBC-24 board was replaced or it was turned by mistake.
∗4: RV400 is equipped on the TBC-24 board of board number suffixes 11, 12, and 13.
∗5: RV402 is equipped on the TBC-24 board of board number suffixes 11, 12, and 13 for DNW-A65 use.
∗6: If the specification is not satisfied by adjusting RV300 on TBC-24 board, change the data of A37 : TBC VR : SQ Y RZ.
∗7: If the specification is not satisfied by adjusting RV500 on TBC-24 board, change the data of A37 : TBC VR : SQ C RZ.
∗8: RV504 is equipped on the TBC-24 board of board number suffixes 14 and higher.
∗9: If the specification is not satisfied by adjusting RV200 on TBC-23A board, change the data of A37 : TBC VR : VISC PHASE.

2-10-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the Betacam / Betacam SP PB system alignment.

1. Reset the all switches on the DM-89 and TBC-23A boards to the factory settings.

   Note

   Before removing the board, turn off the power.

Board	Ref. No.	Factory setting
DM-89	S101, S102, S301, S302	NOR (right side)
	S501	ON (right side)
	S901	all OFF (down side)
TBC-23A	S1, S500	all OFF (down side)

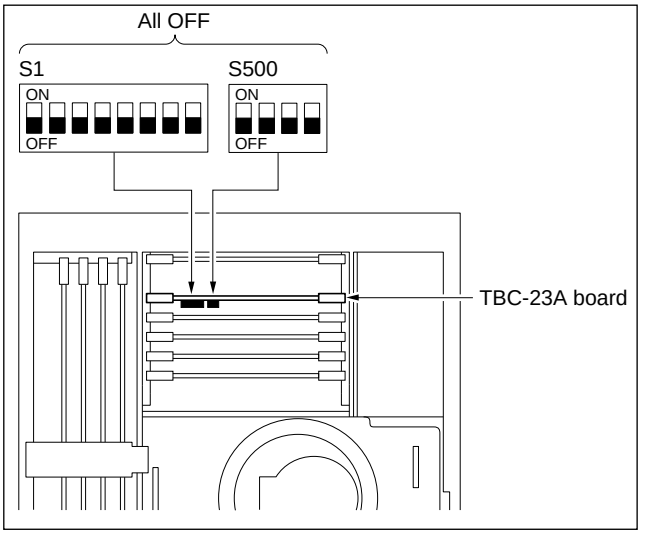
2. Set the VTR's switches as follows:

Location Item	Customer setting	Setting at adjustment
SS-83 board DIP switch S1100-1 (M-1)	_____	⇨ ON (up position)
Note Set to treat the extended menu of the setup menu.		
Sub control panel		
CHARACTER switch	_____	⇨ ON
PROCESS CONTROL switch	_____	⇨ LOCAL
• VIDEO switch	_____	⇨ PRESET
• CHROMA switch	_____	⇨ PRESET
• SET UP / BLACK LEVEL switch	_____	⇨ PRESET
• Y/C DELAY switch	_____	⇨ PRESET
• CHROMA PHASE switch	_____	⇨ PRESET
KEY INHIBIT switch	_____	⇨ OFF
CAPSTAN LOCK switch	_____	⇨ 2FD
Upper control panel		
TC (LTC/AUTO/VISC)	_____	⇨ LTC
REMOTE: 9P	_____	⇨ Off (Light off)
50P	_____	⇨ Off (Light off)

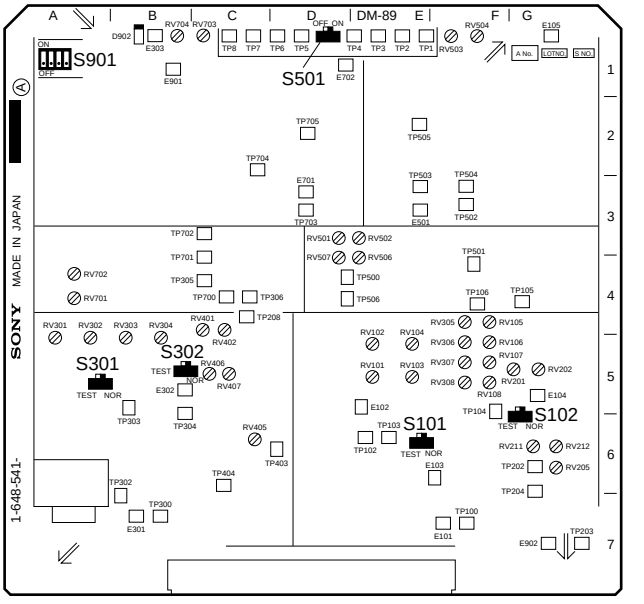
3. For the DNW-A65 only: Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting	Setting at adjustment
709 : CAV LEVEL FORMAT		
1. OUTPUT CAV LEVEL	_____	⇨ B-CAM
713 : VIDEO SETUP REFERENCE LEVEL		
0. MASTER LEVEL	_____	⇨ 0.0%
3. BETACAM PB LEVEL	_____	⇨ MSTER
4. OUTPUT LEVEL	_____	⇨ MSTER

4. Insert the cleaning tape, and press the EJECT and PLAY buttons simultaneously.
   - The EJECT button blinks and the PLAY button light. And the cleaning tape is played for about 5 seconds, before it is automatically ejected.



S1 and S500 on TBC-23A Board



DM-89 Board (Side A)

2-10-3. Initial Data Settings

Input the initial data as the adjustment data of the analog Betacam PB system when the following cases only.

- When the DM-89 board was replaced.
- When the TBC-23A board was replaced.
- When the NV-RAM (IC908) on the DM-89 board was replaced.
- When the NV-RAM (IC200) on the TBC-23A board was replaced.

Preparing tool

- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

1. Initial Data Settings (Standard System)

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A3 : BETACAM PB ADJUST.
3. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, set the initial data to each item of the following sub-menus (A31 to A36).
   DNW-A65: Data on 525/60 column
   DNW-A65P: Data on 625/50 column

Item (A3 : BETACAM ADJUST)		Initial data 525/60	625/50
A32 : DM VR 1	EQ1 METAL-Y-A	77	71
	EQ1 METAL-Y-B	77	71
	EQ1 METAL-C-A	7B	79
	EQ1 METAL-C-B	7B	79
	EQ1 OXIDE-Y-A	9B	AD
	EQ1 OXIDE-Y-B	9B	AD
	EQ1 OXIDE-C-A	9F	AA
	EQ1 OXIDE-C-B	9F	AA
A33 : DM VR 2	MAIN METAL-Y-A	CC	CC
	MAIN METAL-Y-B	CC	CC
	MAIN METAL-C-A	8F	8F
	MAIN METAL-C-B	8F	8F
	MAIN OXIDE-Y-A	A5	A5
	MAIN OXIDE-Y-B	A5	A5
	MAIN OXIDE-C-A	9F	9F
	MAIN OXIDE-C-B	9F	9F
A34 : DM VR 3	SUB METAL-Y-A	B0	C4
	SUB METAL-Y-B	B0	C4
	SUB METAL-C-A	70	70
	SUB METAL-C-B	70	70
	SUB OXIDE-Y-A	B1	B1
	SUB OXIDE-Y-B	B1	B1
	SUB OXIDE-C-A	A5	A5
	SUB OXIDE-C-B	A5	A5
A35 : DM VR 4	GUARD BAND METAL-Y	1C (38*)	26 (29*)
	GUARD BAND METAL-C	1E (21*)	26 (16*)
	GUARD BAND OXIDE-Y	2F (48*)	30 (3B*)
	GUARD BAND OXIDE-C	30 (30*)	30 (16*)
	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0
A36 : DM VR 5	DO TH METAL-Y	14	1E
	DO TH METAL-C	16	1D
	DO TH OXIDE-Y	27	28
	DO TH OXIDE-C	28	28
	ENV-TH-H	20	20
	ENV-TH-L	10	10

*: When the board number suffix of the DM-89 board is 13.

4. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, set the inital data to each item of the following sub-menu (A37).
   DNW-A65: Data on 525/60 column
   DNW-A65P: Data on 625/50 column

Item (A3 : BETACAM ADJUST)		Initial data 525/60	625/50
A37 : TBC VR	SQ Y RZ	4B	4A
	SQ C RZ	6F	6E
	VISC PHASE	05	03

5. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.
6. To exit the maintenance mode, press the MENU button four times.

2. Initial Data Setting (Another System)

7. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.) And switch the video system of the video monitor.
8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A3 : BETACAM PB ADJUST.
10. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, set the initial data to each item of the sub-menus (A31 to A36).
    DNW-A65: Data on 625/50 column in step 3
    DNW-A65P: Data on 525/60 column in step 3
11. When the TBC-23A board or NV-RAM (IC200/DM-89) was as replaced only, set the initial data to each item of the sub-menu (A37).
    DNW-A65: Data on 625/50 column in step 4
    DNW-A65P: Data on 525/60 column in step 4
12. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
13. To exit the maintanance mode, press the MENU botton four times.
14. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the video monitor.
    DNW-A65: 525/60 system (NTSC)
    DNW-A65P: 625/50 system (PAL)

2-10-4. EQ RF Output Level Adjustment

Adjust the EQ RF output level referring to “2-6-3. Betacam / Betacam SP Format PB System (EQ RF Output Level) Adjustment”.

2-10-5. Cosine Equalizer Adjustment

Note

If the network analyzer is not available, perform “2-10-6. Cosine Equalizer Provisional Adjustment”.

Preparing tools

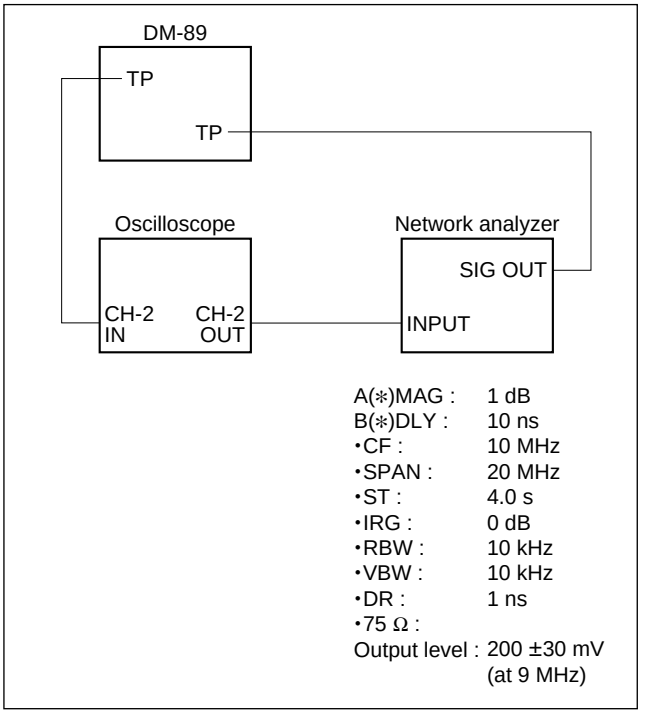
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Network analyzer: ANRITSU MS420B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)

  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Network Analyzer

Preparation of Cosine Equalizer Adjustment

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Set the following switches on the DM-89 board.

S901-1, -3 (A-1) ⇨ ON
S101(E-6), S301(A-5) ⇨ TEST (left side)

Other switches are the factory setting.
(Refer to step 1 in “2-10-2. Common Preparation”.)

3. Check the setting on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

5. Connect the equipment.

Connect the oscilloscope and network analyzer. (Refer to Figure “Connection and Setting of Network Analyzer”.)

6. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Enter the Maintenance Mode and Check the Initial Data

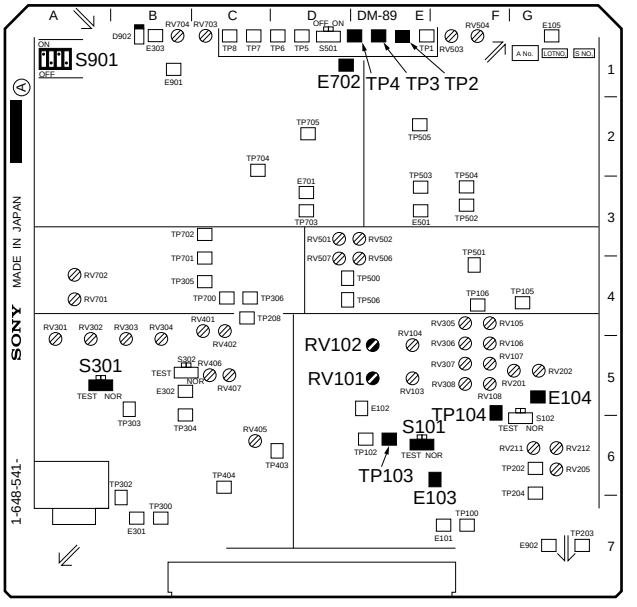
1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A35 : DM VR 4, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.) (This is OMC DC offset setting data check.)

Item (A35 : DM VR 4)	Setting data
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

3. To exit A35 : DM VR 4, press the MENU button once.

When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, perform the follow in step 4 through 7.

4. Enter A33 : DM VR 2, then check that the initial data of the all items in A33 : DM VR 2 are the specified data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the specified data.)
5. To exit A33 : DM VR 2, press the MENU button once.
6. Enter A34 : DM VR 3, then check that the initial data of the all items in A34 : DM VR 3 are the specified data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the specified data.)
7. To exit A34 : DM VR 3, press the MENU buttom once.



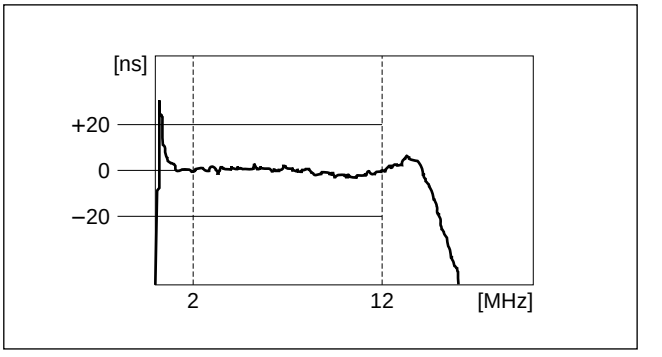
DM-89 Board (Side A)

2. METAL Y Adjustment

1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)
3. Insert the following alignment tape in order to set STANDBY OFF mode.
   DNW-A65: CR5-1B
   DNW-A65P: CR5-1B PS

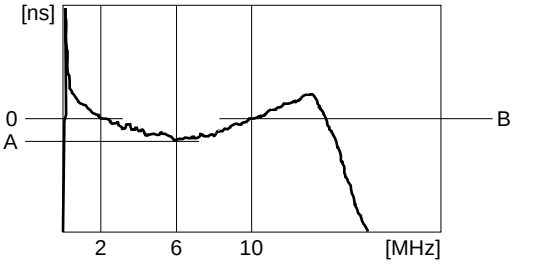
Group delay adjustment / METAL Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89 (F-5). GND: E104/DM-89(G-5)
5. Adjust the group delay time in 2 MHz through 12 MHz.
   Adj. points: ⊘RV101/DM-89(E-5) and ⊘RV102/DM-89(E-5)
   Specification: 0 ±20 ns



6. For DNW-A65 only:
   Adjust each delay times at 6 MHz and 10 MHz using 2 MHz as the reference.
   Adj. points: 6 MHz: ⊘RV101/DM-89(E-5)
   10 MHz: ⊘RV102/DM-89(E-5)
   Specifications: 6 MHz: A = −10 ±3 ns
   10 MHz: B = 0 ±3 ns

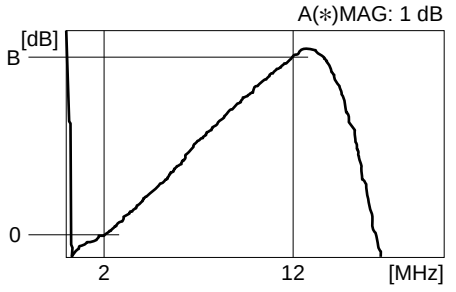
DNW-A65 only



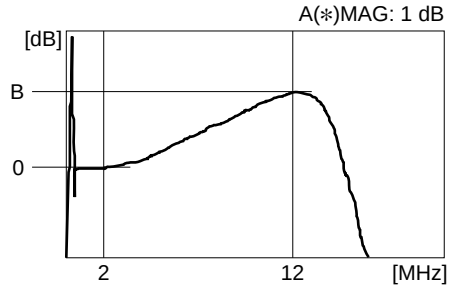
Main adjustment / METAL Y

7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Enter A33 : DM VR 2.
9. Adjust the level at 12 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-Y-A
   Specification: DNW-A65: B = +8.0 ±0.5 dB
   DNW-A65P: B = +3.5 ±0.5 dB

DNW-A65



DNW-A65P

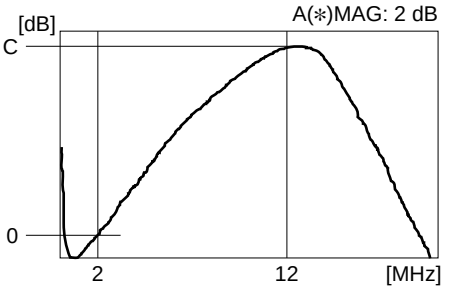


10. Set the data of "MAIN METAL-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-Y-A".
11. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / METAL Y

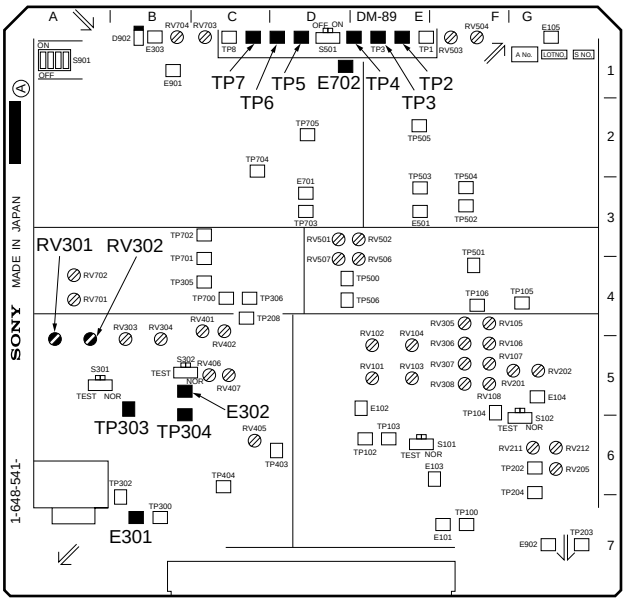
12. Enter A34 : DM VR 3.
13. For DNW-A65:
    Check that the data of "SUB METAL-Y-A" and "SUB METAL-Y-B" in A34 : DM VR 3 are B0. (If not, set them to B0.)
    For DNW-A65P:
    (1) Connect the oscilloscope's CH-2 input to TP2/DM-89(E-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 12 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-Y-A
    Specification: C = +16.5 ±1.0 dB

DNW-A65P only



    (3) Set the data of "SUB METAL-Y-B" in A34 : DM VR 3 to the identical data value as "SUB METAL-Y-A".

14. To exit A34 : DM VR 3, press the MENU button once.
15. Disconnect the shorting clip from TP4/DM-89(E-1).



DM-89 Board (Side A)

3. METAL C Adjustment

1. Short-circuit TP6/DM-89(D-1) and E702/DM-89(D-1) with a shorting clip.
2. Connect the network analyzer's output to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

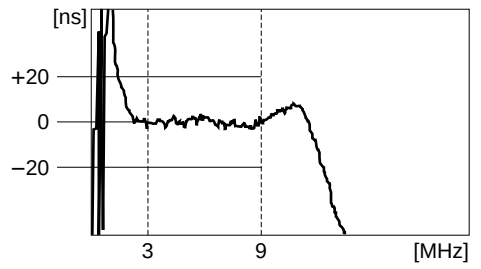
Note

The alignment tape (CR5-1B or CR5-1B PS) is still in the VTR. (STANDBY OFF mode)

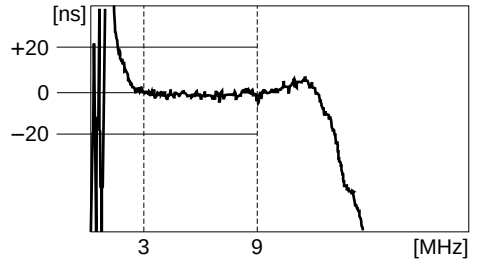
Group delay adjustment / METAL C

3. Connect the oscilloscope's CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
4. Adjust the group delay time in 3 MHz through 9 MHz.
   Adj. points: ⊘RV301/DM-89(A-5) and
   ⊘RV302/DM-89(A-5)
   Specification: 0 ±20 ns

DNW-A65



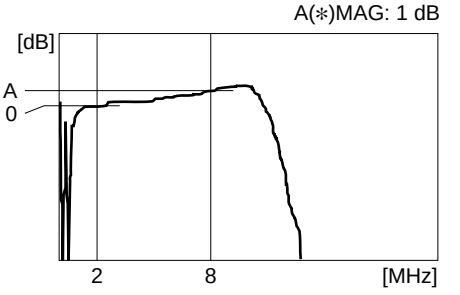
DNW-A65P



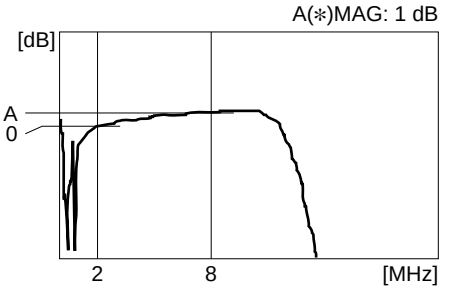
Main adjustment / METAL C

5. Enter A33 : DM VR 2.
6. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
7. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN METAL-C-A
   Specification: B = +0.5 ±0.5 dB

DNW-A65



DNW-A65P



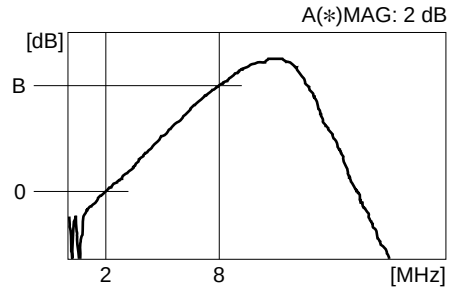
8. Set the data of "MAIN METAL-C-B" in A33 : DM VR 2 to the identical data value as "MAIN METAL-C-A".
9. To exit A33 : DM VR 2, press the MENU button once.

http://getMANUAL.com

Sub adjustment / METAL C

10. Enter A34 : DM VR 3.
11. For DNW-A65:
    Check that the data of “SUB METAL-C-A” and “SUB METAL-C-B” in A34 : DM VR 3 are 70. (If not, set them to 70.)
    For DNW-A65P:
    (1) Connect the oscilloscope’s CH-2 input to TP6/DM-89(D-1). GND: E702/DM-89(D-1)
    (2) Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB METAL-C-Y
    Specification: B = +9.2 ±1.0 dB

DNW-A65P only



    (3) Set the data of “SUB METAL-C-B” in A34 : DM VR 3 to the identical data value as “SUB METAL-C-A”.

12. To perform the tape operation, press the SET button once.
13. Eject the alignment tape.
14. To operate the maintenance mode, press the MENU button once.
15. To exit A34 : DM VR 3, press the MENU button once.

4. OXIDE C Adjustment

1. Insert the following alignment tape in order to set STANDBY OFF mode.
   DNW-A65: CR5-2A
   DNW-A65P: CR5-2A PS

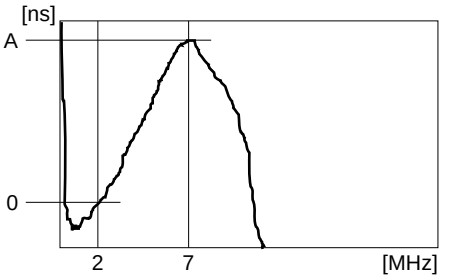
Notes

- Shorting clip is in short circuit between TP5/DM-89 (D-1) and E702/DM-89(D-1).
- The network analyzer’s output is in connection to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

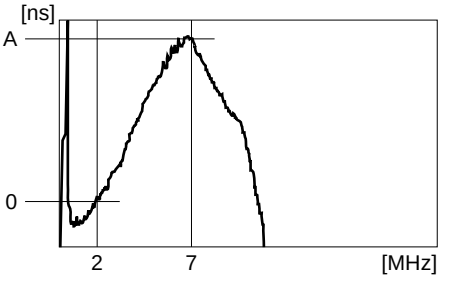
Group delay adjustment / OXIDE C

2. Connect the oscilloscope’s CH-2 input to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
3. Adjust the delay time at 7 MHz using 2 MHz as the reference.
   Adj. points: ⊘RV303/DM-89(B-5) and
   ⊘RV304/DM-89(B-5)
   Specification: A = 70 ±5 ns

DNW-A65



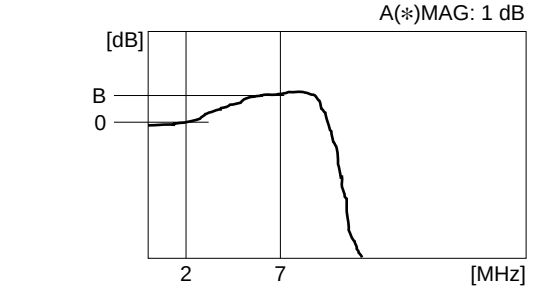
DNW-A65P



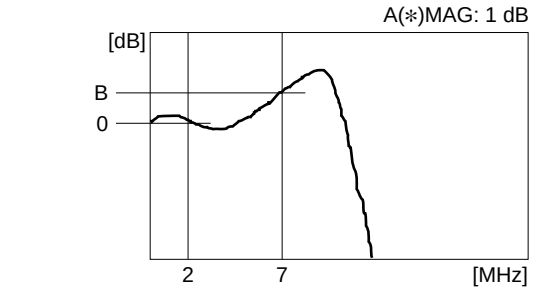
Main adjustment / OXIDE C

4. Enter A33 : DM VR 2.
5. Connect the oscilloscope's CH-2 input to TP7/DM-89 (C-1). GND: E702/DM-89(D-1)
6. Adjust the level at 7 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-C-A
   Specification: B = +1.2 ±0.5 dB

DNW-A65



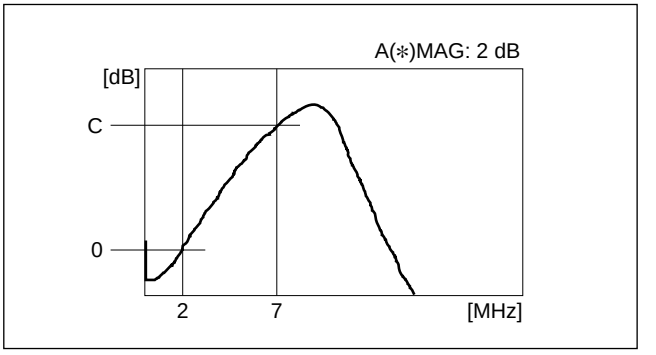
DNW-A65P



7. Set the data of "MAIN OXIDE-C-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-C-A".
8. To exit A33 : DM VR 2, press the MENU button once.

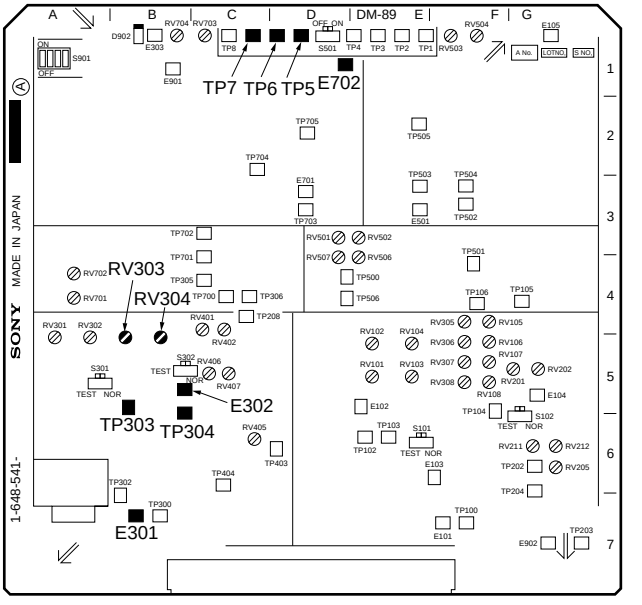
Sub adjustment / OXIDE C

9. Enter A34 : DM VR 3.
10. Connect the oscilloscope's CH-2 input to TP6/DM-89 (D-1). GND: E702/DM-89(D-1)
11. Adjust the level at 7 MHz using 2 MHz as the reference.
    Adj. point: A34 : DM VR 3 : SUB OXIDE-C-A
    Specification: C = +11.0 ±0.5 dB



12. Set the data of "SUB OXIDE-C-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-C-A".
13. To exit A34 : DM VR 3, press the MENU button once.

14. Disconnect the shorting clip from TP5/DM-89(D-1).



DM-89 Board (Side A)

5. OXIDE Y Adjustment

1. Short-circuit TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
2. When ⊘RV103/DM-89(E-5) is equipped, turn it fully counterclockwise (↺).
3. Connect the network analyzer's output to TP103/DM-89(E-6). GND: E103/DM-89(F-6)

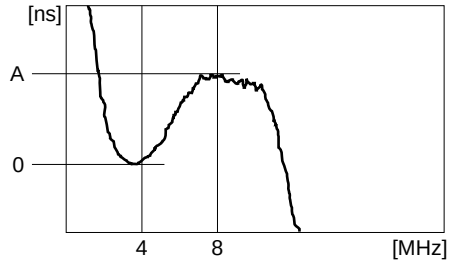
Note

The alignment tape (CR5-2A or CR5-2A PS) is still in the VTR. (STANDBY OFF mode)

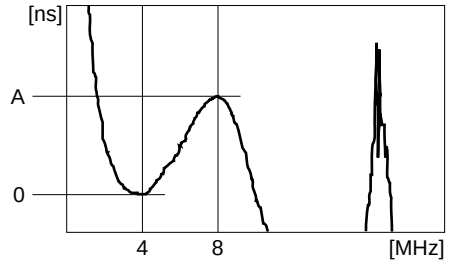
Group delay adjustment / OXIDE Y

4. Connect the oscilloscope's CH-2 input to TP104/DM-89(F-5). GND: E104/DM-89(G-5)
5. Adjust the delay time at 8 MHz using 4 MHz as the reference.
   Adj. point: ⊘RV104/DM-89(E-5)
   Specification: DNW-A65: A = 40 ±5 ns
   DNW-A65P: A = 40 ±3 ns

DNW-A65



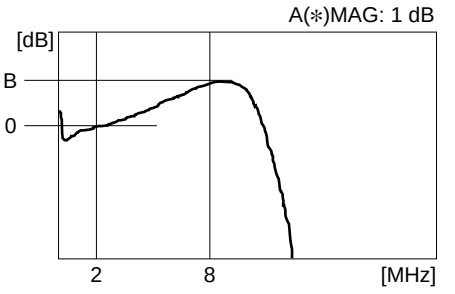
DNW-A65P



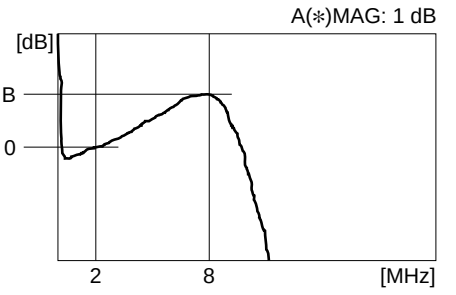
Main adjustment / OXIDE Y

6. Enter A33 : DM VR 2.
7. Connect the oscilloscope's CH-2 input to TP3/DM-89 (E-1). GND: E702/DM-89(D-1)
8. Adjust the level at 8 MHz using 2 MHz as the reference.
   Adj. point: A33 : DM VR 2 : MAIN OXIDE-Y-A
   Specification: DNW-A65: B = +2.0 ±0.5 dB
   DNW-A65P: B = +2.5 ±0.5 dB

DNW-A65



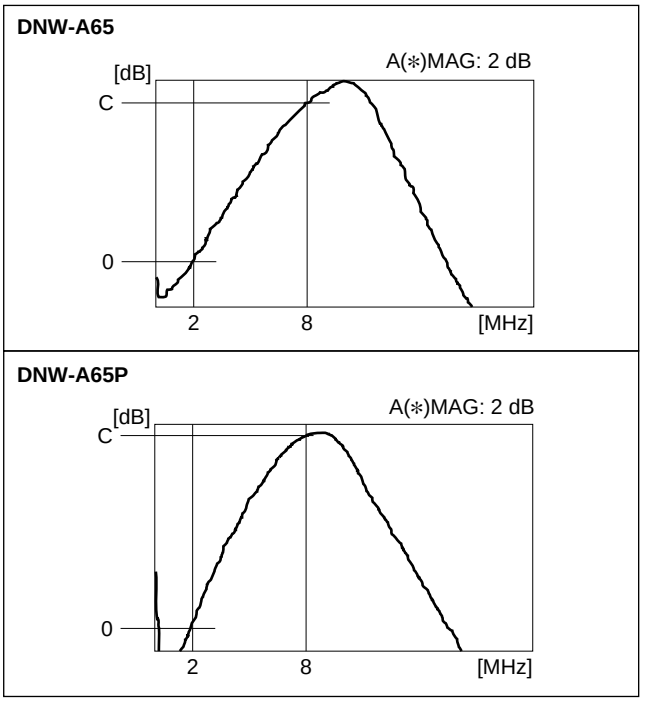
DNW-A65P



9. Set the data of "MAIN OXIDE-Y-B" in A33 : DM VR 2 to the identical data value as "MAIN OXIDE-Y-A".
10. To exit A33 : DM VR 2, press the MENU button once.

Sub adjustment / OXIDE Y

11. Enter A34 : DM VR 3.
12. Connect the oscilloscope's CH-2 input to TP2/DM-89 (E-1). GND: E702/DM-89(D-1)
13. Adjust the level at 8 MHz using 2 MHz as the reference.
    Adj. point: A33 : DM VR 3 : SUB OXIDE-Y-A
    Specification: DNW-A65: C = +14.0 ±0.5 dB
    DNW-A65P: C = +17.0 ±0.5 dB



14. Set the data of "SUB OXIDE-Y-B" in A34 : DM VR 3 to the identical data value as "SUB OXIDE-Y-A".

15. To perform the tape operation, press the SET button once.
16. Eject the alignment tape.
17. To operate the maintenance mode, press the MENU button once.
18. To exit A34 : DM VR 3, press the MENU button once.

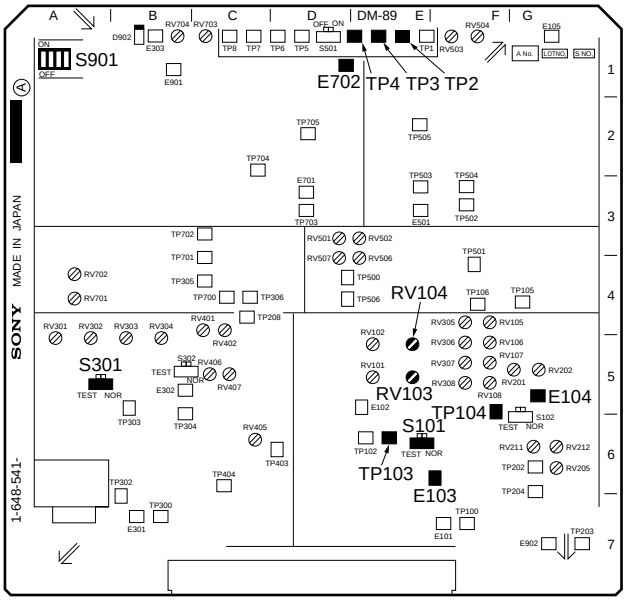
19. Remove the shorting clip between TP4/DM-89(E-1) and E702/DM-89(D-1).
20. Return S101/DM-89(E-6) and S301/DM-89(A-5) to "NOR" side (right side).
21. Return the switches No. 1 and No. 3 of S901/DM-89 (A-1) to OFF (down side).

6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
2. To exit the maintenance mode, press the MENU button four times.



DM-89 Board (Side A)

2-10-6. Cosine Equalizer Provisional Adjustment

Note

- This provisional adjustment explains how to adjust without using the network analyzer.
  When the performed "2-10-5. Cosine Equalizer Adjustment" using the network analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the network analyzer is not available. If this provisional adjustment is done, it is recommended to perform "2-10-5. Cosine Equalizer Adjustment" using the network analyzer.

Preparing tools

- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Settings of Adjustment Data (Check)

1. To enter the maintenance mode, press S1101(L-1) on the SS-63 board.
2. Set the specified data value to each item of the following sub-menus (A33 to A35) in A3 : BETACAM PB ADJUST .
   DNW-A65: DATA on 525/60 column
   DNW-A65P: DATA on 625/50 column

(A3 :BETACAM ADJUST) Sub-menu	Item	Setting data 525/60	625/50
A33 : DM VR 2	MAIN METAL-Y-A	CC	CC
	MAIN METAL-Y-B	CC	CC
	MAIN METAL-C-A	8F	8F
	MAIN METAL-C-B	8F	8F
	MAIN OXIDE-Y-A	A5	A5
	MAIN OXIDE-Y-B	A5	A5
	MAIN OXIDE-C-A	9F	9F
	MAIN OXIDE-C-B	9F	9F
A34 : DM VR 3	SUB METAL-Y-A	B0	C4
	SUB METAL-Y-B	B0	C4
	SUB METAL-C-A	70	70
	SUB METAL-C-B	70	70
	SUB OXIDE-Y-A	B1	B1
	SUB OXIDE-Y-B	B1	B1
	SUB OXIDE-C-A	A5	A5
	SUB OXIDE-C-B	A5	A5
A35 : DM VR 4	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0

3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

4. To exit the maintenance mode, press the MENU button four times.

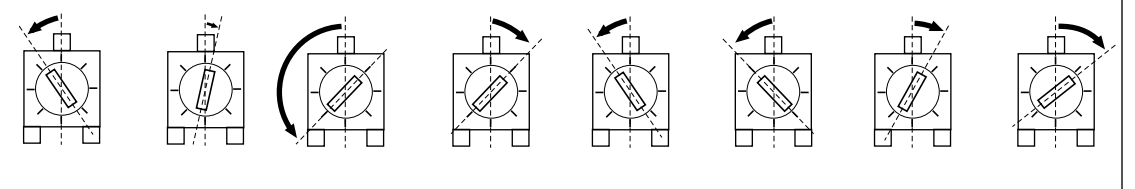
Settings of RVs

Set the following RVs on the DM-89 board to each specified position as shown figure below.

Note

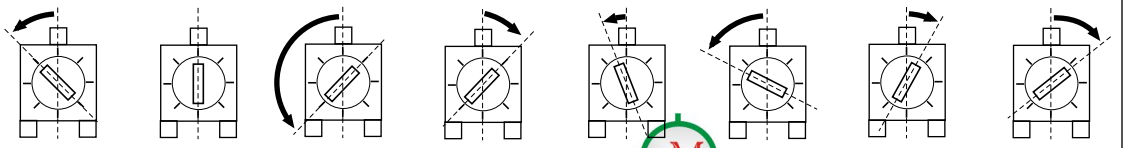
RV103 is not equipped on the DM-89 board of the LOT Nos. 407 and higher.

DNW-A65

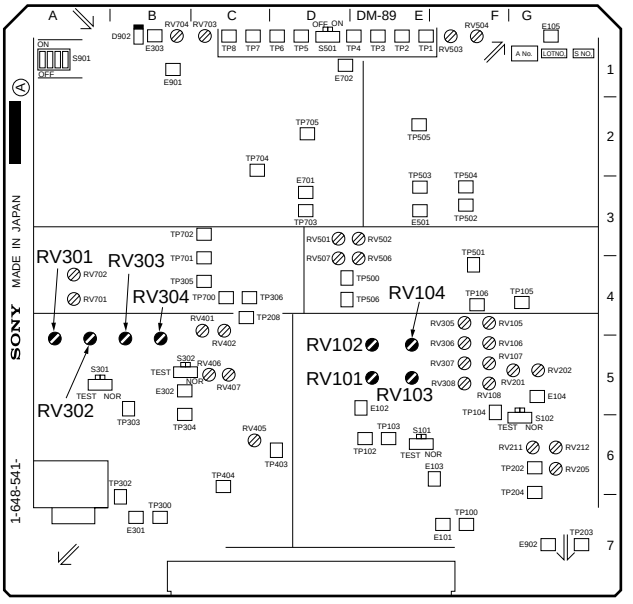


RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)

DNW-A65P



RV101 (E-5) RV102 (E-5) RV103 (E-5) RV104 (E-5) RV301 (A-5) RV302 (A-5) RV303 (B-5) RV304 (B-5)



DM-89 Board (Side A)

2-10-7. DM RF Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

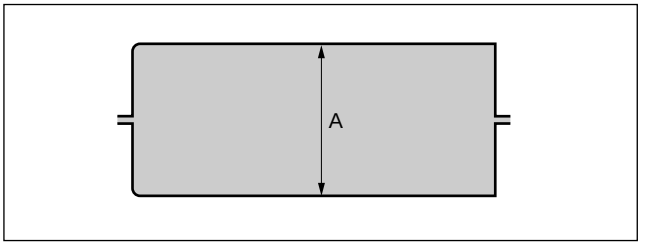
KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. METAL Y Adjustment

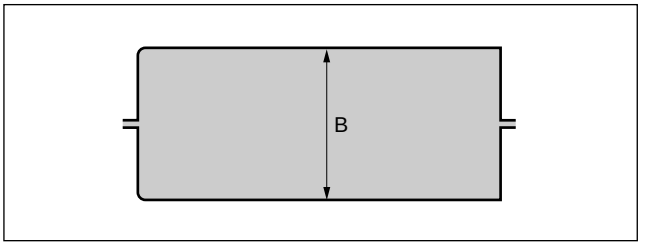
1. Connect and set the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), AC 100 mV/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, − slope
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV211/DM-89(G-6)
   Specification: A = 400 ±40 mV p-p



3. Stop the playback of the alignment tape.

2. METAL C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV406/DM-89(C-5)
   Specification: B = 400 ±40 mV p-p



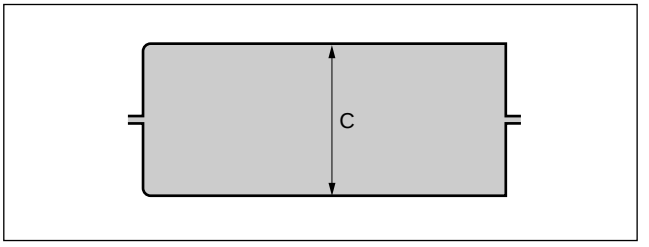
3. Eject the alignment tape.

3. OXIDE C Adjustment

Note

Connection of the oscilloscope remains unchanged.

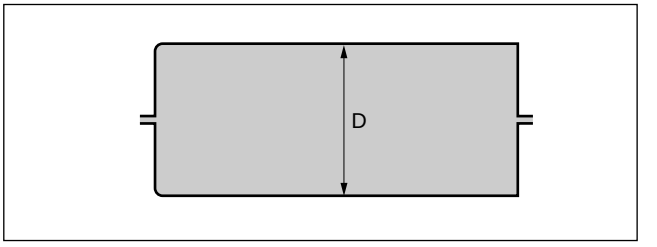
1. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV407/DM-89(C-5)
   Specification: C = 400 ± 40 mV p-p



2. Stop the playback of the alignment tape.

4. OXIDE Y Adjustment

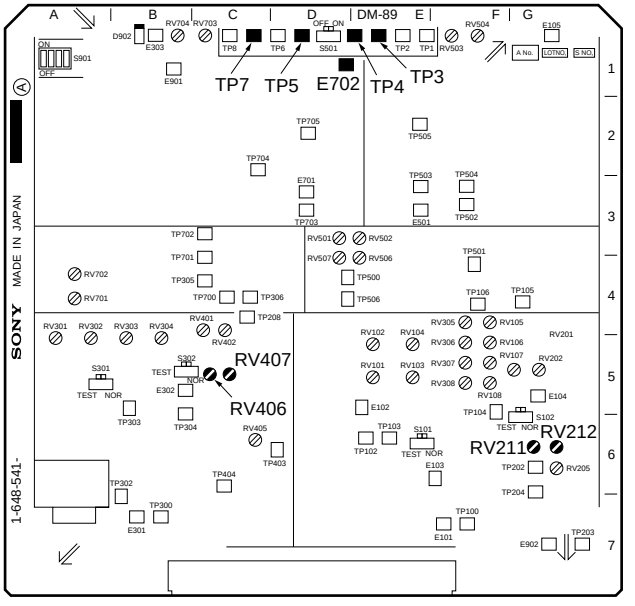
1. Change the connection of the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV212/DM-89(G-6)
   Specification: D = 400 ± 40 mV p-p



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-8. OMC Carrier Balance Adjustment”.



DM-89 Board (Side A)

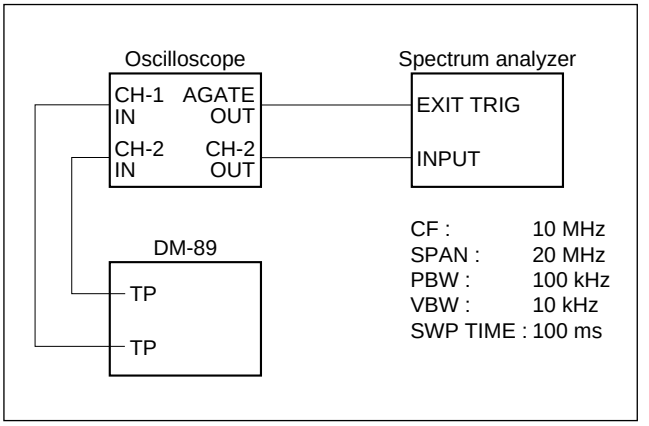
2-10-8. OMC Carrier Balance Adjustment

Note

If the network analyzer is not available, perform "2-10-9. OMC Carrier Balance Provisional Adjustment".

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- Shorting clip



Connection and Setting of Spectrum Analyze

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing the DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

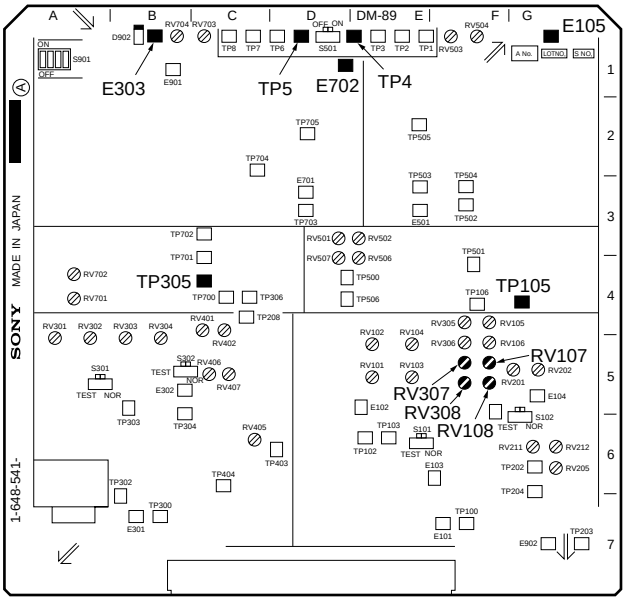
KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)

6. Check that the equipment has warmed up.

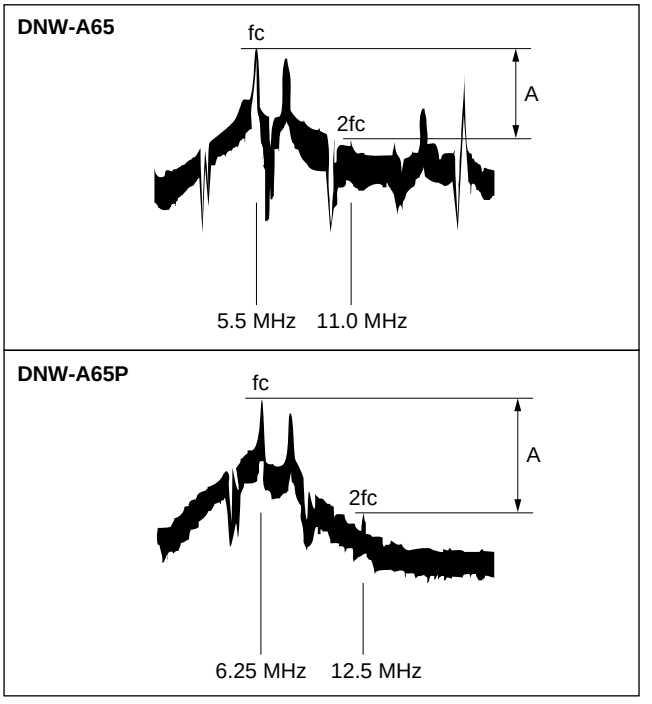
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.



DM-89 Board (Side A)

1. OXIDE Y Adjustment

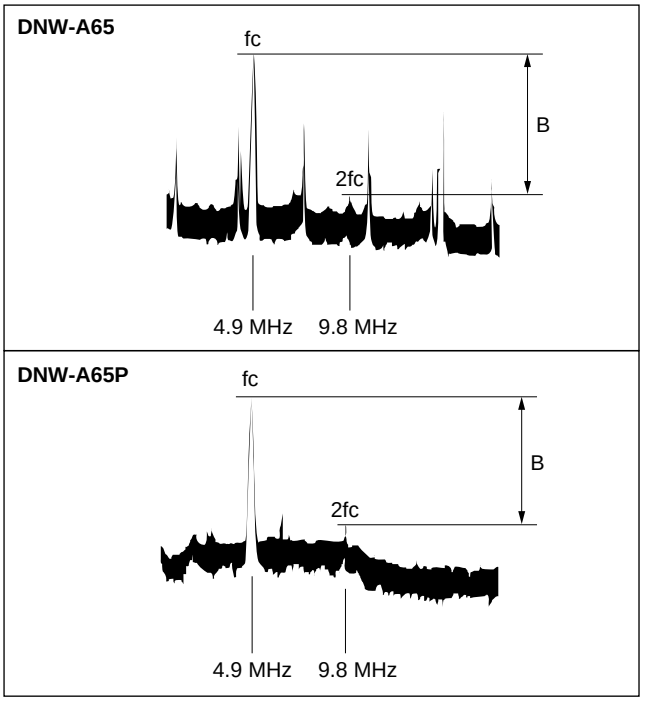
1. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), AC 1 V/DIV
   GND: E105/DM-89(G-1)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
   Specification: A ≧ 35 dB



3. Stop the playback of the alignment tape.

2. OXIDE C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
   CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
   Specification: B ≧ 35 dB



3. Eject the alignment tape.

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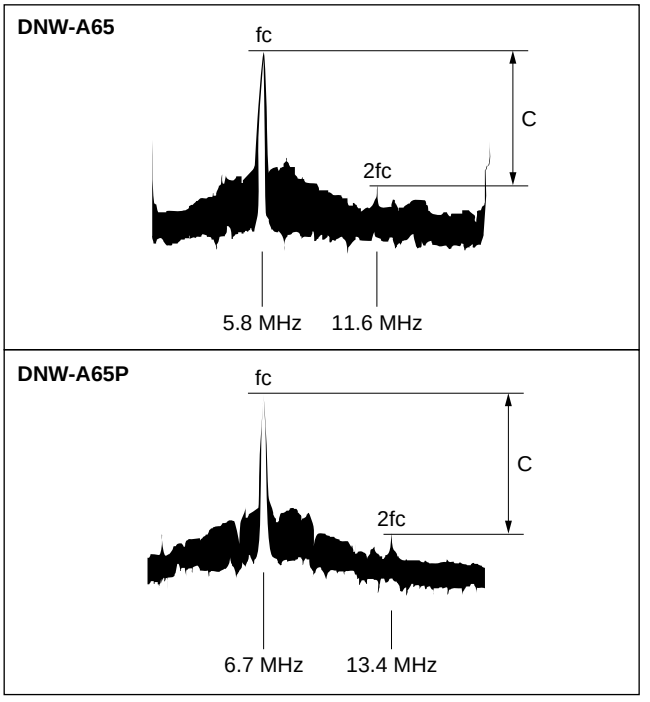
3. METAL C Adjustment

Note

Connection of the oscilloscope remains unchanged.

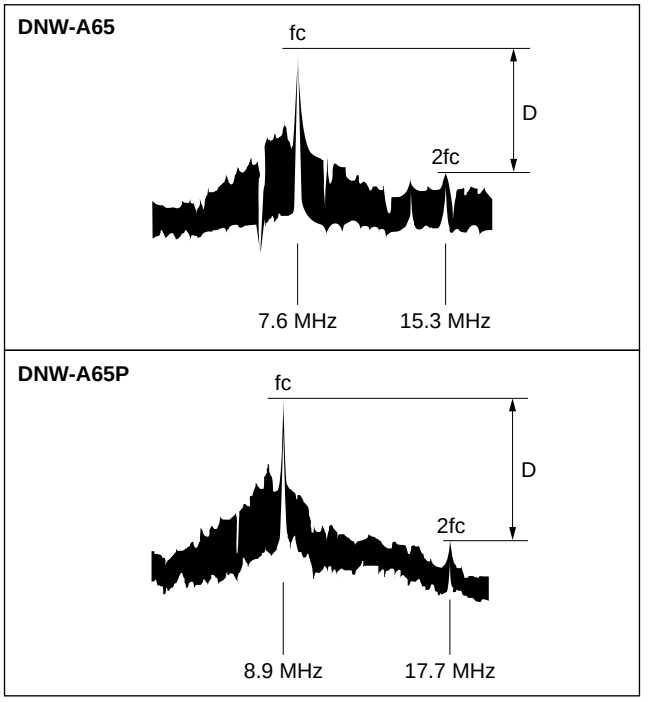
1. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
   Specification: C ≧ 40 dB



2. Stop the playback of the alignment tape.

4. METAL Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)
2. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
   Specification: D ≧ 40 dB



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-10. Demodulator Limiter Balance Adjustment”.

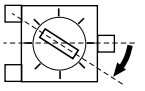
2-10-9. OMC Carrier Balance Provisional Adjustment

Notes

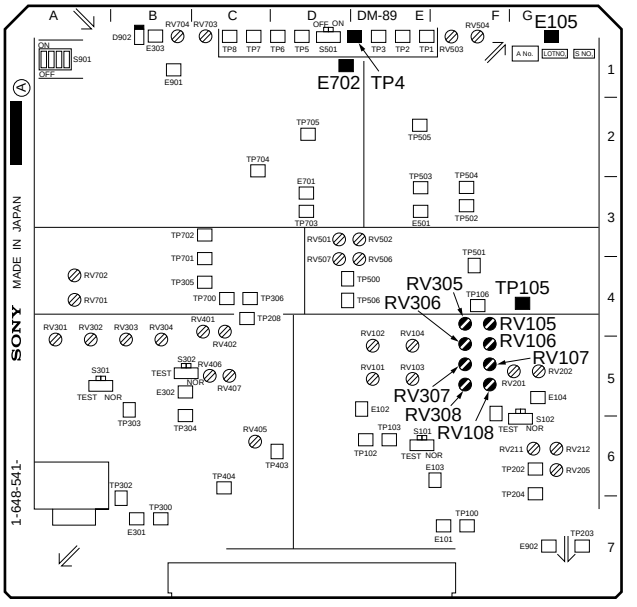
- This provisional adjustment explains how to adjust without using the spectrum analyzer.
  When the performed “2-10-8. OMC Carrier Balance Adjustment” using the spectrum analyzer, this provisional adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to perform “2-10-8. OMC Carrier Balance Adjustment” using the spectrum analyzer.

Settings of RVs

Set the following RVs on the DM-89 board to specified position respectively as shown below.



RV105 (F-4)
RV106 (F-5)
RV107 (F-5)
RV108 (F-5)
RV305 (F-4)
RV306 (F-5)
RV307 (F-5)
RV308 (F-5)



DM-89 Board (Side A)

2-10-10. Demodulator Limiter Balance Adjustment

Note

For the Y adjustment:
When the spectrum analyzer is not available for an urgent maintenance, omit steps 2 through 4 in the Y adjustment. If step 1 is done only, be sure to perform the steps 2 through 4 in the Y adjustment at a later date.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

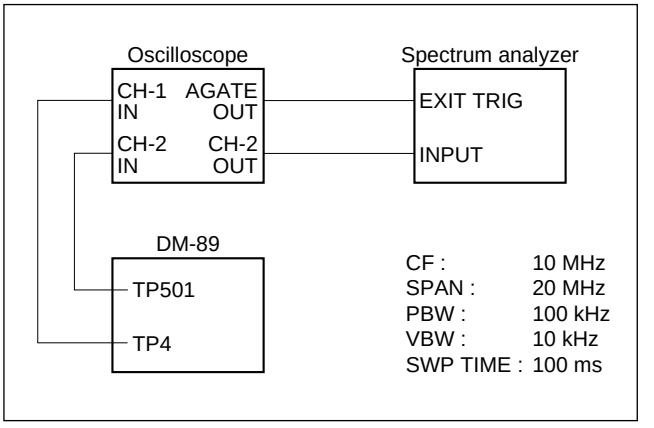
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Connect the equipment.

Connect the oscilloscope and spectrum analyzer. (Refer to Figure "Connection and Setting of Spectrum Analyzer".)



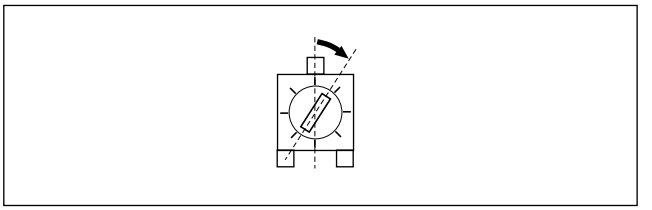
Connection and Setting of the Spectrum Analyzer

6. Check that the equipment has warmed up.

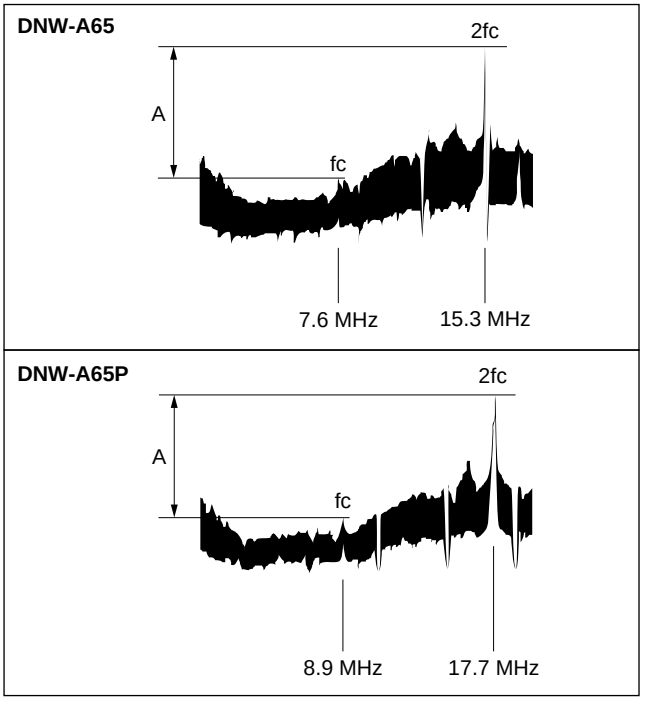
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Y Adjustment

1. Set RV502/DM-89(E-3) to the specified position as shown figure below.



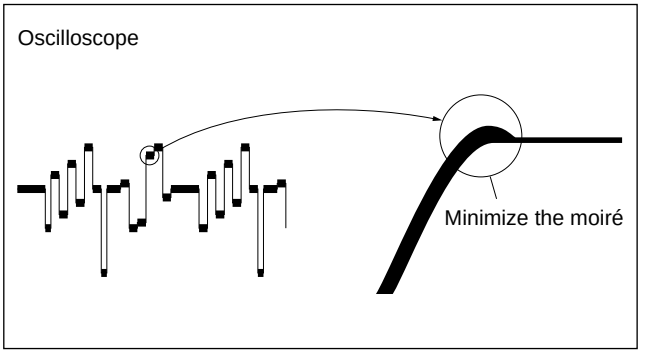
2. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP501/DM-89(F-4), AC 1 V/DIV
   GND: E501/DM-89(E-3)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
3. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV502/DM-89(E-3)
   Specification: Maximize the level difference A. (Minimize the fc.)



4. Stop the playback of the alignment tape.

2. C Adjustment

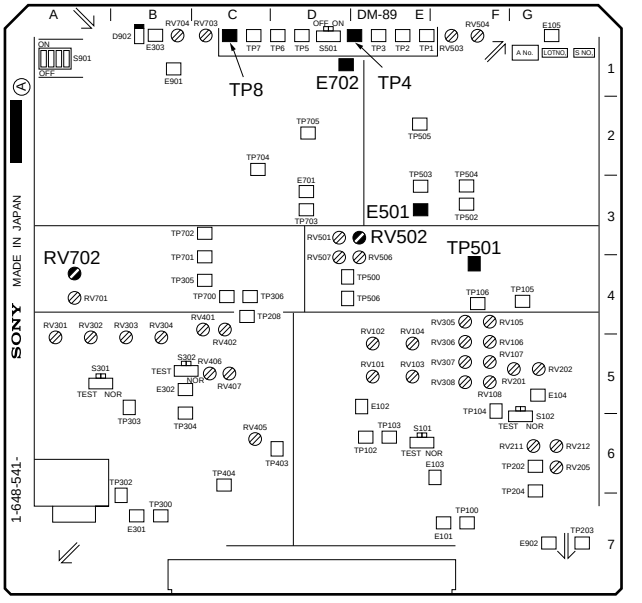
1. Connect and set the oscilloscope as follows:
   CH-1: TP8/DM-89(C-1), AC 200 mV/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the moiré of specified part on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV702/DM-89(A-4)
   Specification: Minimize the moiré of specified part.



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-11. Non-Liner Output Level Adjustment”.



DM-89 Board (Side A)

2-10-11. Non-Liner Output Level Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNWA-65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNWA-65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

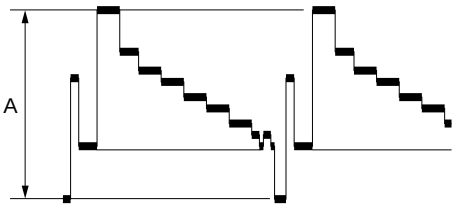
5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

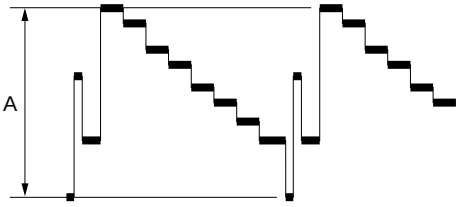
1. METAL Y Adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), AC 200 mV/DIV
   GND: E501/DM-89(E-3)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV503/DM-89(F-1)
   Specification: A = 1.00 ±0.01 V

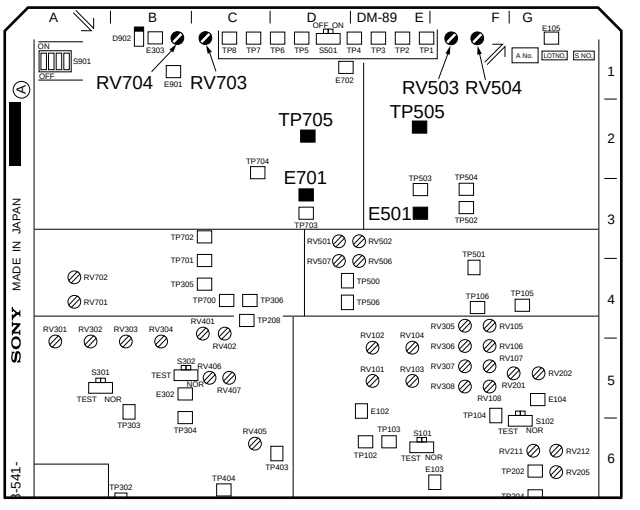
DNW-A65



DNW-A65P



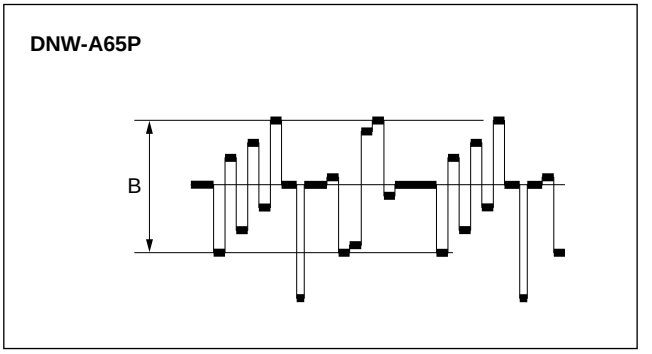
3. Stop the playback of the alignment tape.



DM-89 Board (Side A)

2. METAL C Adjustment for DNW-A65P Only

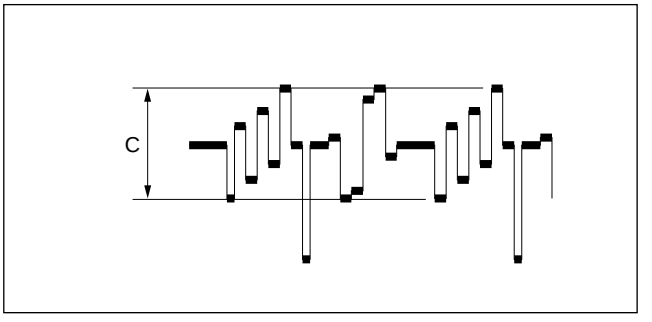
1. Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 100% color-bar signal (14:00 to 17:00) of CR5-1B PS
   Adj. point: ◓RV703/DM-89(C-1)
   Specification: B = 933 ± 10 mV



3. Eject the alignment tape.

4. METAL C (DNW-A65) / OXIDE C (DNW-A65P) Adjustment

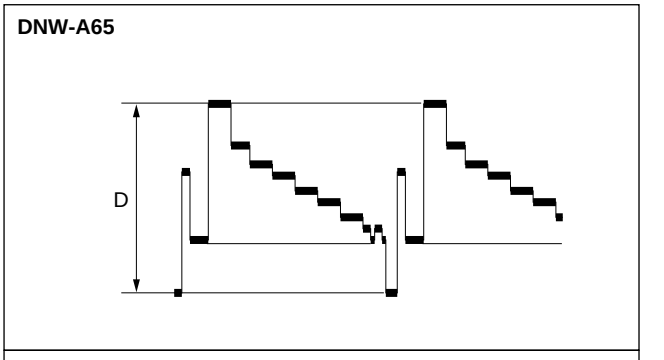
1. Change the connection of the oscilloscope as follows:
   CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal
   DNW-A65: 14:00 to 17:00 in CR5-1B
   DNW-A65P: 0:00 to 3:00 in CR5-2A PS
   Adj. point: ◓RV704/DM-89(B-1)
   Specification: C = 700 ± 10 mV

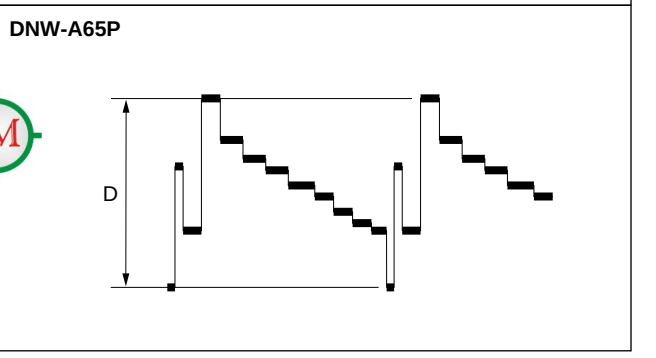


3. Stop the playback of the alignment tape.
4. For DNW-A65 only: Eject the alignment tape.

3. OXIDE Y Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP505/DM-89(E-2), GND: E501/DM-89(E-3)
2. During play back the alignment tape in PLAY mode, adjust the level of specified part on the oscilloscope.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ◓RV504/DM-89(F-1)
   Specification: D = 1.00 ± 0.01 V





3. Eject the alignment tape.

2-10-12. PB Frequency Response Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor: TEKTRONIX WFM300 or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41) and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91) and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the DM-89 and TBC-23A boards.

Reset the switch settings on the DM-89 and TBC-23A boards to the factory settings.
(Refer to step 1 in “2-10-2. Common Preparation”.)

4. Check the settings on the upper control panel.

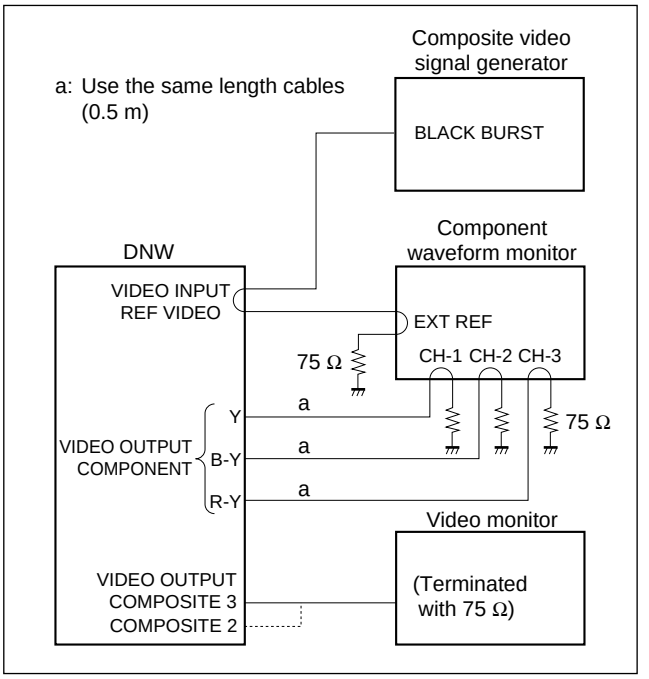
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

6. Connect the equipment.

(Refer to Figure “Connection”.)



Connection

7. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A32 : DM VR 1.

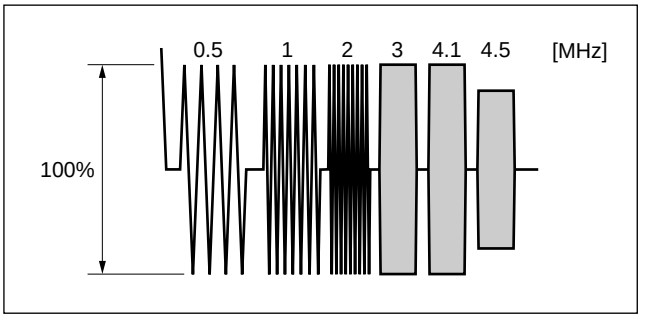
3. When the DM-89 board or NV-RAM (IC908/DM-89) was replaced only, check that the data of all items in A32 : DM VR 1 are the initial data value.
   (Refer to Section 2-10-3 for the initial data. If not, set them to the initial data.)
4. To perform the tape operation, press the SET button once.

2. METAL Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A65) / 2T BAR (DNW-A65P) .
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 4.1 MHz (DNW-A65) / 5 MHz (DNW-A65P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
   Specification (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specification (A and B channels):
   See the table below.
8. Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
9. During play back the alignment tape in PLAY mode, check the playback picture on the video monitor.
   PB portion: The same as step 2
   Specification: It has not flicker.
10. Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

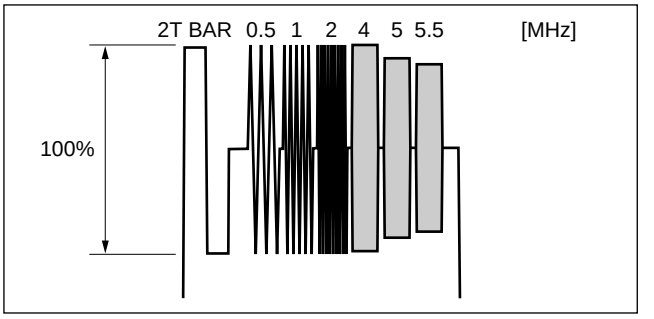
Specifications for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
4.1 MHz	Adjust: 94% (100 to 90%) {$-0.5\ ^{+0.5}_{-0.4}$ dB}
1 MHz 2 MHz 3 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check: 80% (106 to 63%) {$-2.0\ ^{+2.5}_{-2.0}$ dB}



Specifications for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 2T BAR is 100% {0 dB}.)
5 MHz	Adjust: 91% (96 to 87%) {-0.8 ± 0.4 dB}
0.5 MHz 1 MHz 2 MHz 4 MHz	Check: 100% (106 to 63%) {$0\ ^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check: 84% (106 to 63%) {$-1.5\ ^{+2.0}_{-2.5}$ dB}

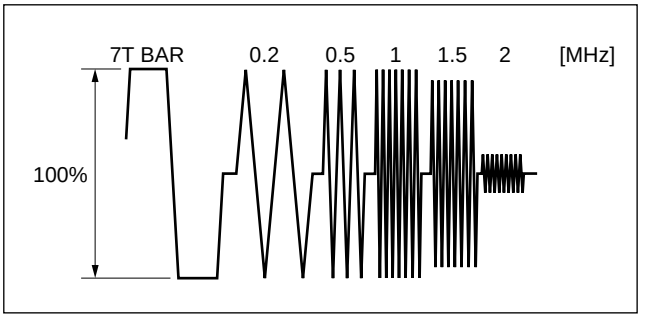


3. METAL C Adjustment

1. Watch the R-Y output signal on the analog component waveform monitor.
   Note
   As the R-Y(B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A65) / 8T BAR (DNW-A65P).
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz (DNW-A65) / 1.5 MHz (DNW-A65P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-C-A
   B channel: A32 : DM VR 1 : EQ1 METAL-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.

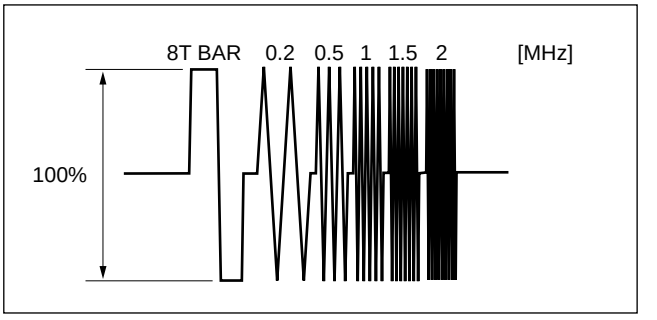
Specifications for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
1 MHz	Adjust: 94% (100 to 89%) {−0.5 ±0.5 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 8T BAR is 100% {0 dB}.)
1.5 MHz	Adjust: 93% (102 to 85%) {−0.6 ±0.8 dB}
0.2 MHz 0.5 MHz 1 MHz	Check: 100% (106 to 71%) {0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



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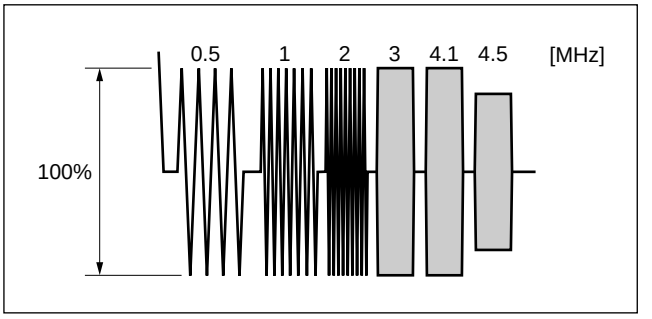
4. OXIDE Y Adjustment

1. Watch the Y output signal on the analog component waveform monitor.
   Note
   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A65) / 2T BAR (DNW-A65P).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 2 MHz (DNW-A65) / 3 MHz (DNW-A65P).
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. During play back the alignment tape in PLAY mode, check the output level difference between A and B channels at high frequency (4.5 MHz) part.
   PB portion: The same as step 2
   Specification: It is not noticeable.
   Note
   If the output level difference of A and B channels at 4.5 MHz part is noticeable, change the data of “SUB OXIDE-Y-A” or “SUB OXIDE-Y-B” in A34 : DM VR 3 as following steps (1) to (8).

(1) To operate the maintenance mode, press the MENU button once.
(2) To exit A32 : DM VR 1, press the MENU button once.
(3) Enter A34 : DM VR 3.
(4) Change the data of “SUB OXIDE-Y-A” (A channel side), and judge a lower level channel.

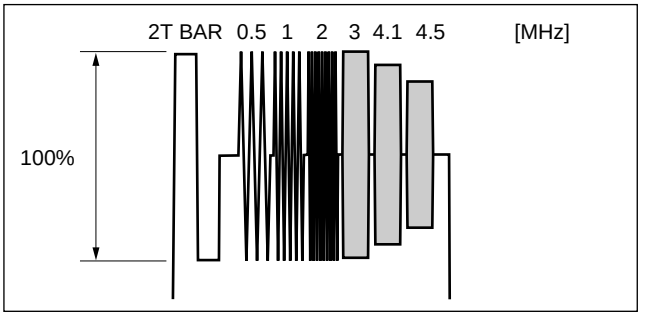
Specifications for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
2 MHz	Adjust: 100% (104 to 95%) {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check: 89% (106 to 50%) {–1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



Specifications for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 2T BAR is 100% {0 dB}.)
3 MHz	Adjust: 89% (100 to 79%) {–1.0 ±1.0 dB}
0.5 MHz 1 MHz, 2 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



(5) If the B channel side is lower: Return the data of “SUB OXIDE-Y-A” to the former data, then adjust (add to the data value) “SUB OXIDE-Y-B” until the level at 4.5 MHz of B channel is equal to the level at 4.5 MHz of A channel.
If the A channel side is lower: Adjust (add to the data value) “SUB OXIDE-Y-A” until the level at 4.5 MHz of A channel is equal to the level at 4.5 MHz of B channel.
(6) To exit A34 : DM VR 3, press the MENU button once.
(7) Enter A32 : DM VR 1.
(8) To perform the tape operation, press the SET button once.

5. OXIDE C Adjustment

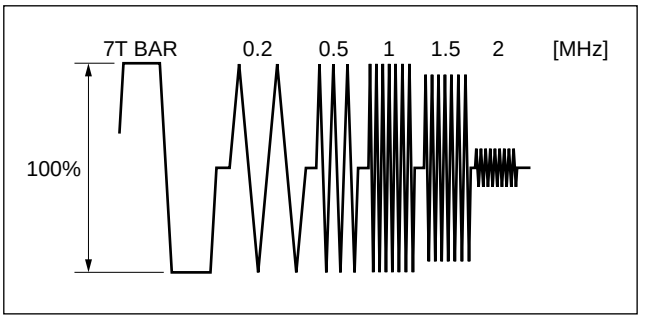
1. Watch the R-Y output signal at the analog component waveform monitor.

   Note

   As the R-Y (B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
2. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A65) / 8T BAR (DNW-A65P).
   PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
   This measured level is reference level 100% (0 dB).
3. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 2
4. To operate the maintenance mode, press the MENU button once.
5. Adjust the level at 1 MHz.
   PB portion: The same as step 2
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A
   B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B
   Specifications (A and B channels):
   See the table below.
6. To perform the tape operation, press the SET button once.
7. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
   PB portion: The same as step 2
   Specifications (A and B channels):
   See the table below.
8. Watch the B-Y output signal on the component waveform monitor.
9. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
10. Eject the alignment tape.
11. To operate the maintenance mode, press the MENU button once.
12. To exit A32 : DM VR 1, press the MENU button once.

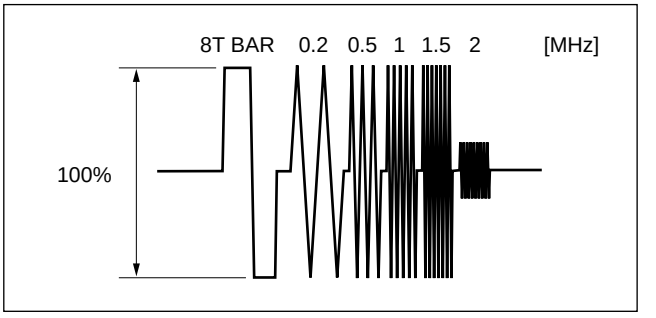
Specifications for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
1 MHz	Adjust: 94% (100 to 89%) {−0.5 ±0.5 dB}
0.2 MHz	Check: 100% (106 to 71%) {0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check: 95% (106 to 71%) {−0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications for DNW-A65P

Frequency	Specification for DNW-A65P (level at 8T BAR is 100% {0 dB}.)
1 MHz	Adjust: 94% (102 to 86%) {−0.5 ±0.8 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 71%) {0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 84% (106 to 71%) {−1.5 $^{+2.0}_{-1.5}$ dB}



6. Data Save (Store the Adjusted Data)

1. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
2. To exit the maintenance mode, press the MENU button four times.

2-10-13. Drop-out Compensation Equalizer Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

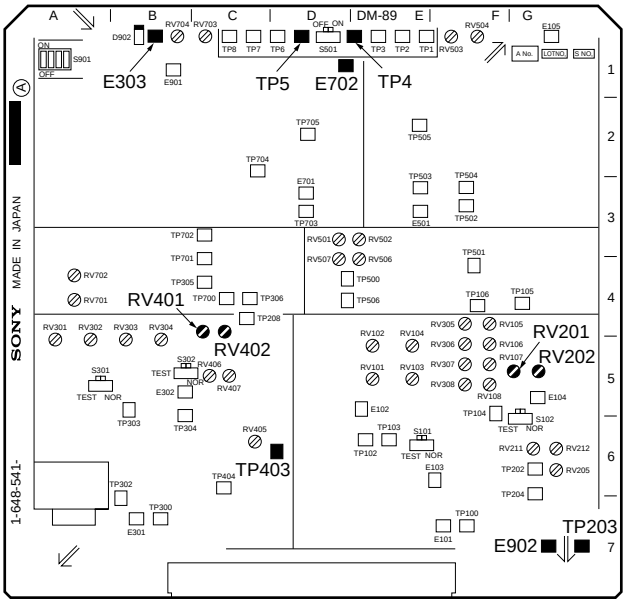
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

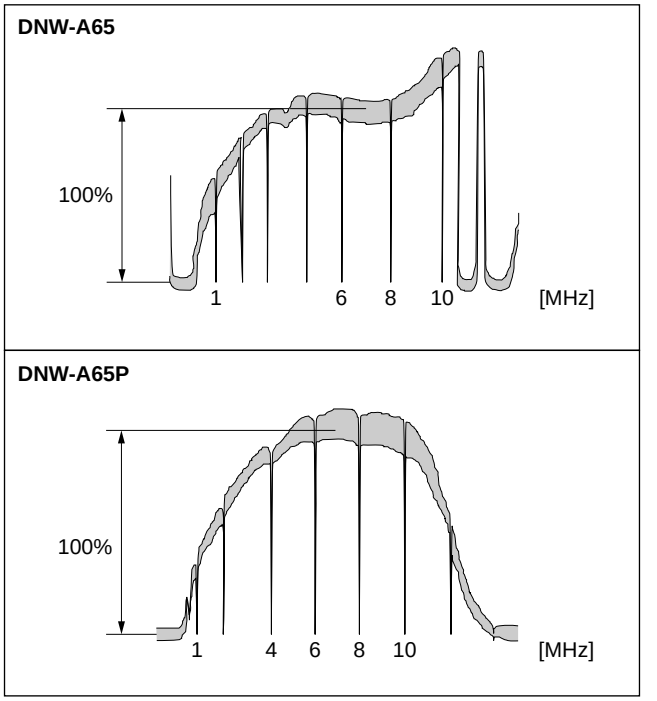
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



DM-89 Board (Side A)

1. METAL Y Adjustment

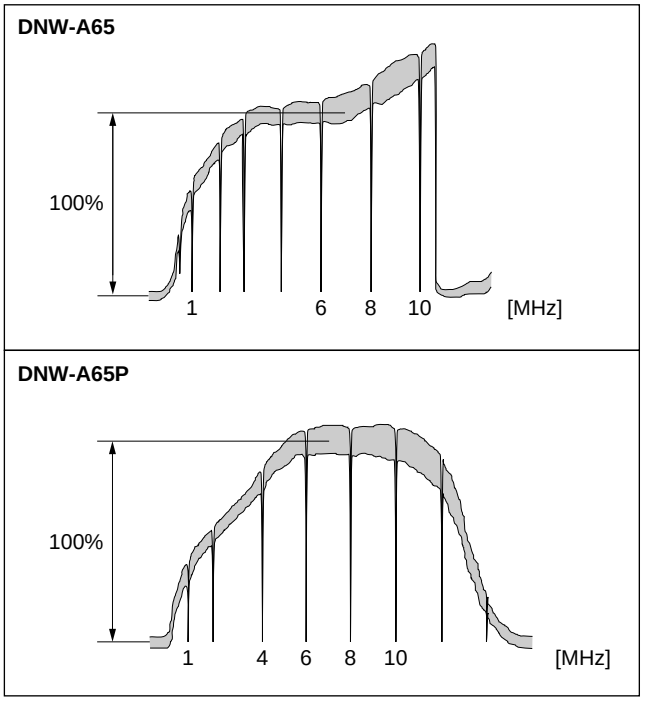
1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC >200 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, − slope
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ◓RV201/DM-89(G-5)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ± 20 % {0 ± 2.0 dB}
   10 MHz: DNW-A65: 120 $^{+50}_{-20}$ % {2.0 $^{+5.0}_{-2.0}$ dB}
   DNW-A65P: 110 $^{+40}_{-20}$ % {1.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.

2. METAL C Adjustment

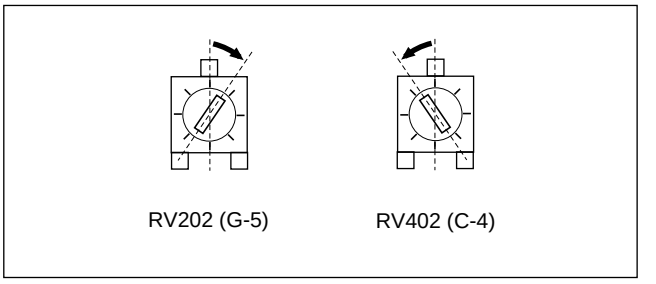
1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
2. During play back the alignment tape in PLAY mode, measure the level at 6 MHz part.
   PB portion: RF sweep signal (0:00 to 2:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
3. During play back the alignment tape in PLAY mode, adjust the levels at 8 MHz and 10 MHz parts.
   PB portion: The same as step 2
   Adj. point: ⊘RV401/DM-89(G-4)
   Specifications (Level at 6 MHz is 100% {0 dB}.):
   8 MHz: 100 ±20 % {0 ±2.0 dB}
   10 MHz: 110 $^{+40}_{-20}$ % {2.0 $^{+4.0}_{-2.0}$ dB}



4. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent "2-10-14. DM RF Output Level Readjustment".

3. OXIDE Y/C Adjustment

Set the following RVs on the DM-89 board to each specified position as shown figure below.



2-10-14. DM RF Output Level Readjustment

Readjust the DM RF output level referring to Section 2-10-7 again.

2-10-15. RF Envelope Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

1. Threshold Level Setting (Check)

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A36 : DM VR 5, then check that the data of the following items in A35 : DM VR 4 are the specified data value. (If not, set them to the specified data.)

Item (A36 : DM VR 5)	Setting data
ENV-TH-H	20
ENV-TH-L	10

3. To exit A36 : DM VR 5, press the MENU button once.

Data save (Store the adjusted data)

When the data was not changed in step 2, skip over to step 6.

4. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

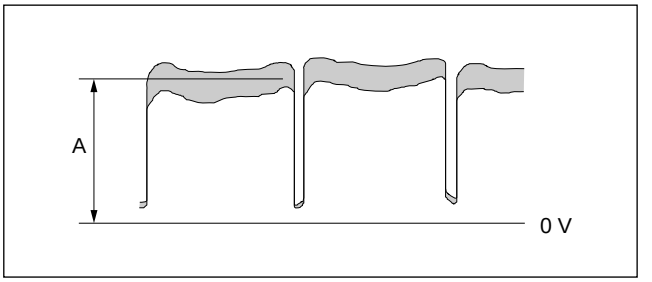
   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
5. To exit A3F : NV-RAM CONTROL, press the MENU button once.

6. To exit the maintenance mode, press the MENU button three times.

2. Y Adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC 500 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 5 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV205/DM-89(G-6)
   Specification: A = 2.0 ±0.2 V dc

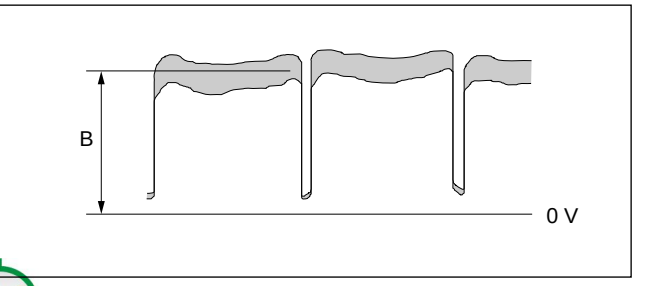


3. Stop the playback of the alignment tape.

3. C Adjustment

1. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6)
   GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1)
   GND: E702/DM-89(D-1)

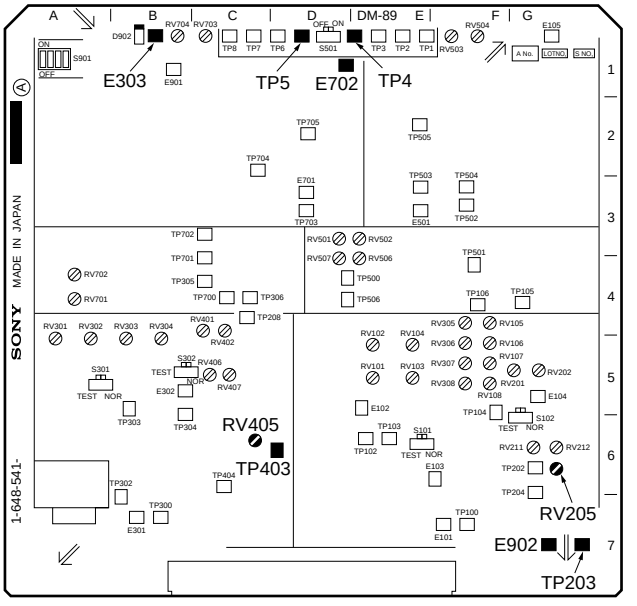
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV405/DM-89(C-6)
   Specification: B = 2.0 ±0.2 V dc



3. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-16. Search Picture Adjustment”.



DM-89 Board (Side A)

2-10-16. Search Picture Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Preparation

1. Extend the DM-89 board with an extension board EX-377.

Note

Before removing DM-89 board, turn off the power.

2. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

5. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Voltage Adjustment

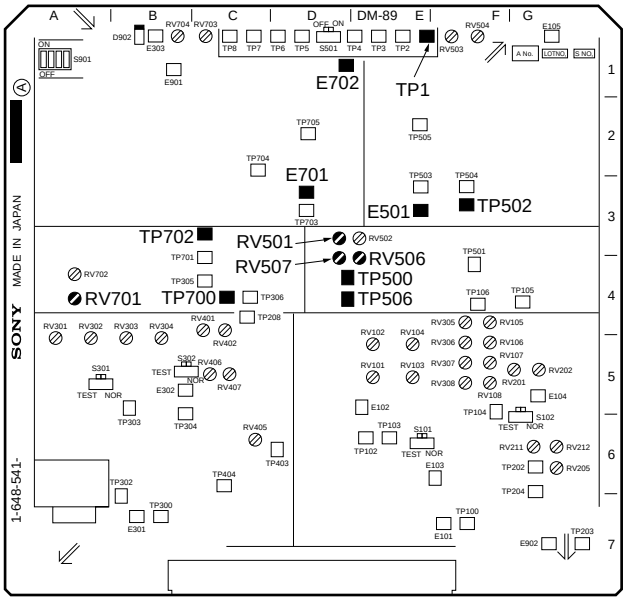
1. During play back the alignment tape in PLAY mode, using the digital voltage meter, measure each DC level at the following measurement points and fill up their measured levels on the following table.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS

Measurement point	Measured DC level (fill up)
TP500/DM-89(D-4)	_____
TP502/DM-89(F-3)	_____
TP702/DM-89(C-3)	_____

2. Stop the playback of the alignment tape.
3. Turn RV507/DM-89(D-4) fully clockwise (↻).
4. Short-circuit TP506/DM-89(D-4) and E501/DM-89 (E-3) with a shorting clip.
5. Short-circuit TP700/DM-89(C-4) and E701/DM-89 (D-3) with a shorting clip.
6. During play back the alignment tape in PLAY mode, adjust each DC level at the following measurement points.
   PB portion: The same as step 1
   Specification: The same measured DC level as step 1

Measurement point	Adjustment point	Remarks
TP500/DM-89(D-4)	⊘RV506/DM-89(E-4)	SPD OFFSET
TP502/DM-89(F-3)	⊘RV501/DM-89(D-3)	Y DEEM
TP702/DM-89(C-3)	⊘RV701/DM-89(A-4)	C DEEM

7. Remove the two shorting clips from DM-89 board.



DM-89 Board (Side A)

2. Gain Adjustment

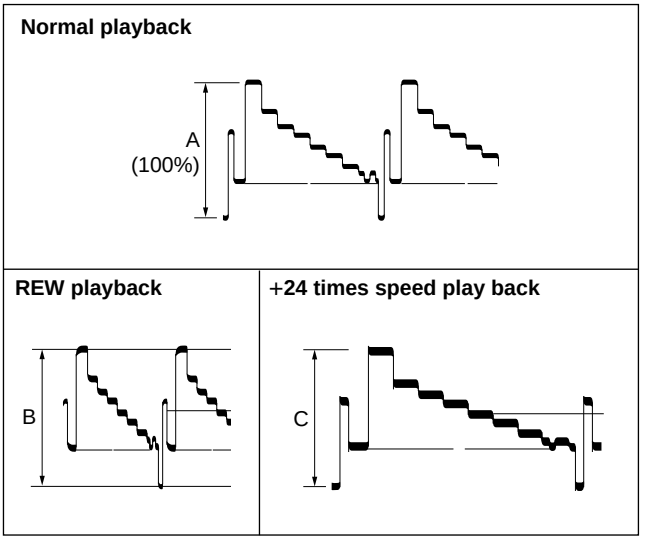
1. Connect and set the oscilloscope as follows:
   CH-1: TP1/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
2. During play back the alignment tape in PLAY mode, measure level of A on the oscilloscope.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   This measured level A is reference level 100% (0 dB).
3. During play back the alignment tape in the following playback mode, adjust the level of B on the oscilloscope.
   PB portion: The same as step 2
   DNW-A65: REW playback
   DNW-A65P: +24 times speed playback
   Adj. point: ⊘RV507/DM-89(D-4)
   Specification (Level in Normal PB is 100% {0 dB}.):
   DNW-A65: B = 100 ±3 % (0 ±0.2 dB)
   DNW-A65P: B = 105 ±5 % (0.4 ±0.4 dB)
4. During play back the alignment tape in the following playback mode, check level of C on the oscilloscope.
   PB portion: The same as step 2
   DNW-A65: +24 times speed playback
   DNW-A65P: REW playback
   Specification (Level in Normal PB is 100% {0 dB}.):
   C = 100 ±10 % (0 ±1.0 dB)
5. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-17. Pairing Check”.

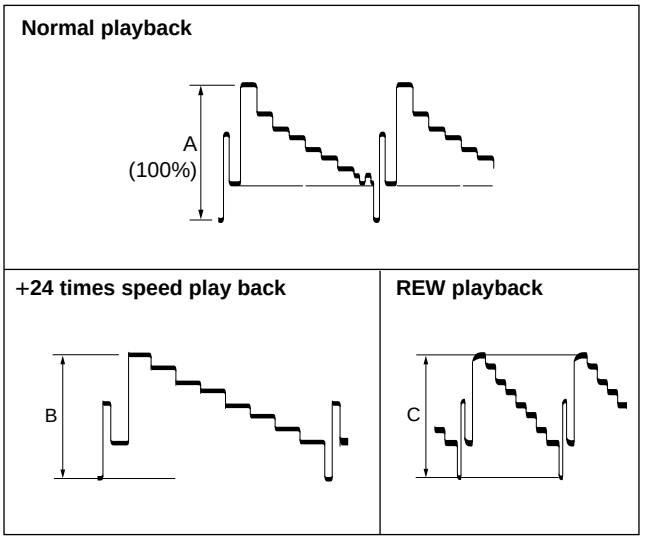
Specifications for DNW-A65

Playback mode	Specification for DNW-A65 (Level A in normal speed is 100% {0 dB}.)
REW	Adjust: B = 100 ±3 % (0 ±0.2 dB)
+24 times speed	Check: C = 100 ±10 % (0 ±1.0 dB)



Specifications for DNW-A65P

Playback mode	Specification for DNW-A65P (Level A in normal speed is 100% {0 dB}.)
+24 times speed	Adjust: B = 105 ±5 % (0.4 ±0.4 dB)
REW	Check: C = 100 ±10 % (0 ±1.0 dB)



2-10-17. Pairing Check

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes

  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

2. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Set the switches on the sub control panel.

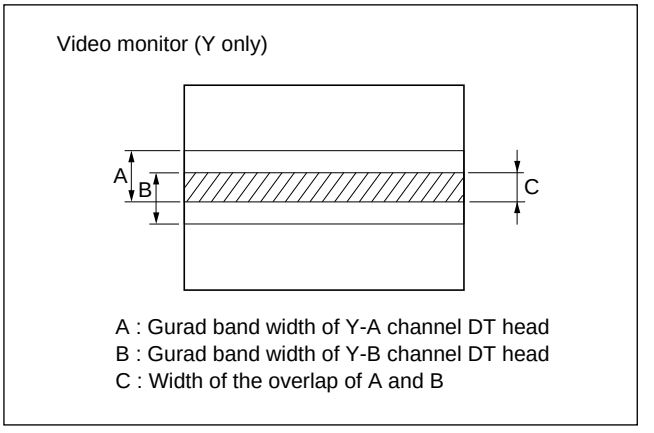
CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

1. METAL Pairing Check

1. Turn the switch No. 2 of S1/TBC-23A(B-2) to ON (up side).
2. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
3. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button (Enters the JOG mode.)
   (2) Press the STOP button (Enters the STOP mode.)
4. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the DT system adjustment (Sections 2-5-6 and 2-5-9).
   Specification: C > A/3 (or C > B/3)


Video monitor (Y only)
A
B
C
A : Gurad band width of Y-A channel DT head
B : Gurad band width of Y-B channel DT head
C : Width of the overlap of A and B

Guard Band

5. Eject the alignment tape.

2. OXIDE Pairing Check

1. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-2A / CR5-2A PS
2. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)
3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the DT system adjustment (Sections 2-5-6 and 2-5-9).
   Specification: C > A/3 (or C > B/3)
   (See the above figure.)
4. Eject the alignment tape.
5. Return the switch No. 2 of S1/TBC-23A(B-2) to OFF (down side).

2-10-18. Guard Band Width Adjustment

Preparing tools

- Analog component video monitor

Note

Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tapes

For DNW-A65: CR5-1B (Part No. 8-960-096-41)
and CR5-2A (Part No. 8-960-097-44)
For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Check the switch settings on the DM-89 board.

Reset the switch settings on the DM-89 board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

2. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

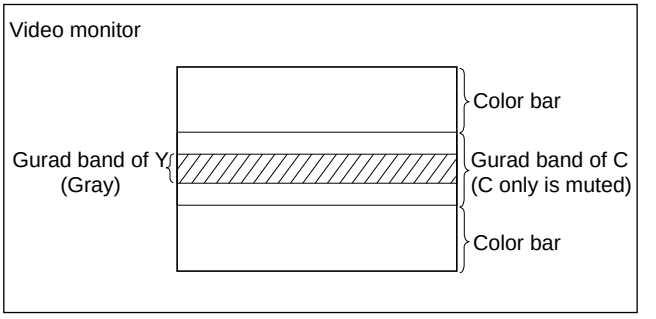
Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A35 : DM VR 4.
3. When the DM-89 board or NV-RAM (IC908/DM-98) was replaced only, check that the data of the following items in A35 : DM VR 4 are the initial data value. (Refer to Section 2-10-3 for the initial data. If not, set them to the initial data.)
   - GUARD BAND METAL-Y
   - GUARD BAND METAL-C
   - GUARD BAND OXIDE-Y
   - GUARD BAND OXIDE-C
4. To perform the tape operation, press the SET button once.
5. Set the CHARACTER switch to OFF.

2. METAL Guard Band Width Check

1. Play back the alignment tape.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
2. Repeat the following step (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)



Guard Band

3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing the following steps (1) through (5).
   Specification 1: Guard band width is below a third of video display screen's height.
   Specification 2: Width of C side > Width of Y side

If the specification 1 or 2 is not satisfied (METAL)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
   Subtract 1 from each data of "GUARD BAND METAL-Y" and "GUARD BAND METAL-C" in A35 : DM VR 4.
   When the specification 2 is not satisfied:
   Add 1 to the data of "GUARD BAND METAL-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

4. Eject the alignment tape.

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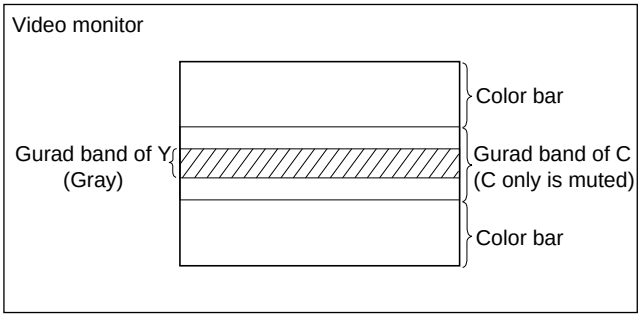
3. OXIDE Guard Band Width Check

1. Play back the alignment tape.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
2. Repeat the following steps (1) and (2) until guard band appears at the center on the video monitor screen.
   (1) Press the JOG button. (Enters the JOG mode.)
   (2) Press the STOP button. (Enters the STOP mode.)



Guard Band

3. Check the state of the guard band width.
   If the specification is not satisfied, check again after performing steps (1) through (5).
   Specification 1: Guard band width is below a half of video display screen's height.
   Specification 2: Width of C side > Width of Y side

If the specification 1 or 2 is not satisfied (OXIDE)

(1) Set the CHARACTER switch to ON.
(2) To operate the maintenance mode, press the MENU button once.
(3) When the specification 1 is not satisfied:
   Subtract 1 from each data of "GUARD BAND OXIDE-Y" and "GUARD BAND OXIDE-C" in A35 : DM VR 4.
   When the specification 2 is not satisfied:
   Add 1 to the data of "GUARD BAND OXIDE-C" in A35 : DM VR 4.
(4) To perform the tape operation, press the SET button once.
(5) Set the CHARACTER switch to OFF.
(6) Perform step 2 again.

4. Eject the alignment tape.

4. Data Save (Store the Adjusted Data)

1. To operate the maintenance mode, press the MENU button once.
2. To exit A35 : DM VR 4, press the MENU button once.

When the data is not changed only, skip over to step 5.

3. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
4. To exit A3F : NV-RAM CONTROL, press the MENU button once.

5. To exit the maintenance mode, press the MENU button three times.

2-10-19. Component Output Level Adjustment

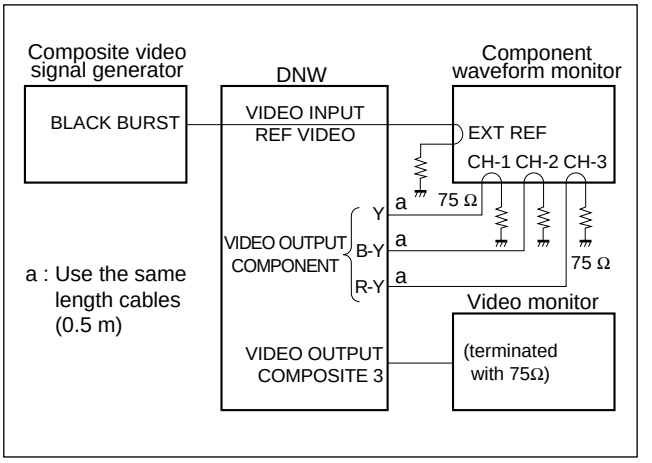
Preparing tools

- Analog composite video signal generator
  For DNW-A65:
  TEKTRONIX TSG-170A or equivalent
  For DNW-A65P:
  TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the DM-89 and TBC-23A boards.

Reset the switch settings on the DM-89 and TBC-23A boards to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

4. Stop the extending of the board.

Do not use the extension board in this adjustment.

Note

Before removing board, turn off the power.

5. Check the settings on the sub control panel.

OUT REF switch ⇨ REF
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP / BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

6. Check the setup extend menu settings. (DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

7. Connect the equipment.

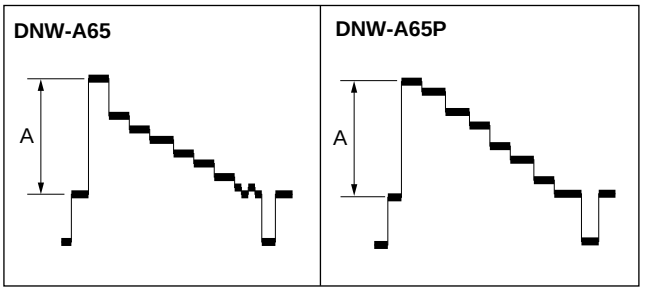
(Refer to Figure "Connection".)

8. Check that the equipment has warmed up.

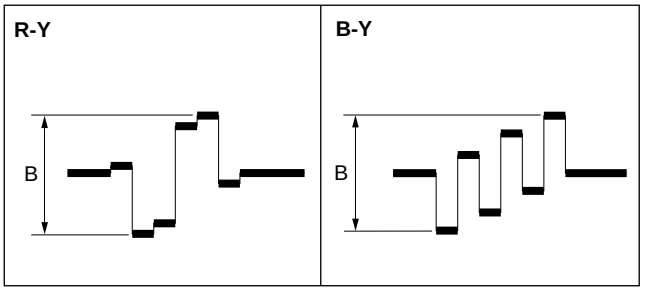
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. METAL Y/C Check

1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
   If the specification is not satisfied, adjust it.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV101/TBC-24(F-1)
   Specification: DNW-A65: A = 714 ±7 mV (100 ±1 IRE)
   DNW-A65P: A = 700 ±7 mV



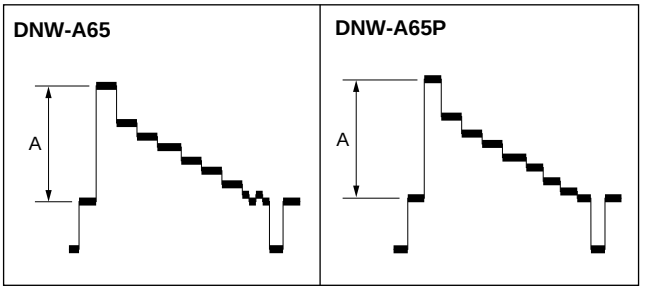
2. During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
   If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
   PB portion: The same as step 1
   Adj. point: ⊘RV201/TBC-24(A/B-1)
   Specification: B = 700 ±7 mV



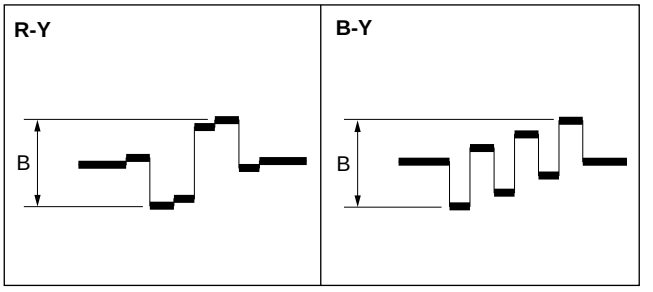
3. Eject the alignment tape.

2. OXIDE Y/C Check

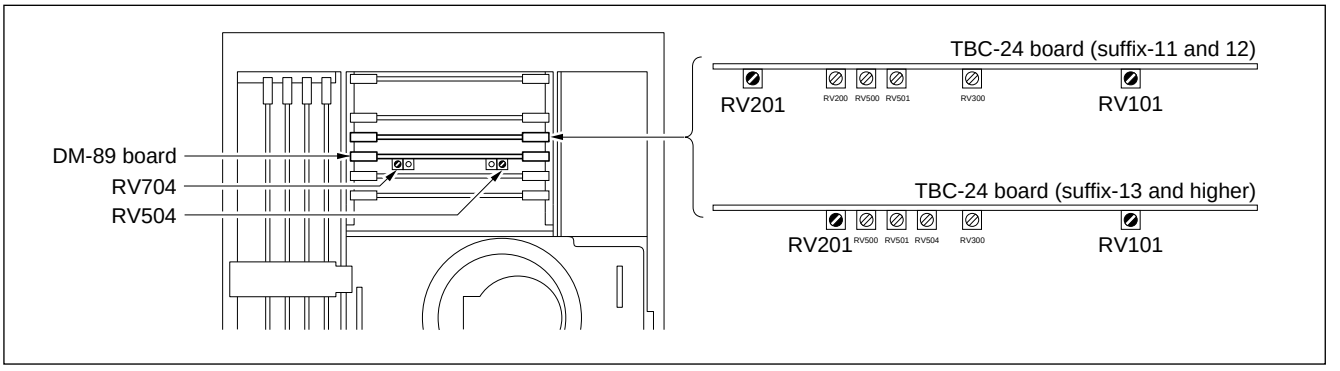
1. During play back the alignment tape in PLAY mode, check the white level of Y signal.
   If the specification is not satisfied, adjust it.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ⊘RV504/DM-89(F-1)
   Specification: DNW-A65: A = 714±7 mV (100±1 IRE)
   DNW-A65P: A = 700 ±7 mV



2. For DNW-A65P only:
   During play back the alignment tape in PLAY mode, check the levels of R-Y and B-Y signals.
   If the specification is not satisfied, adjust so that both levels of R-Y and B-Y signals satisfy the specification.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A PS
   Adj. point: ⊘RV704/DM-89(B-1)
   Specification: B = 525 ±5 mV



3. Eject the alignment tape.



RV504 and RV704 on DM-89 Board, and RV101 and RV201 on TBC-24 Board

2-10-20. A/D Clamp DC Level Adjustment

Note

The A/D clamp DC level adjustment is for the TBC-24 board of the board number suffix -11 or -12.
In the other suffixes, this adjustment is not necessary.

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the power.

2. Check the settings on the upper control panel.

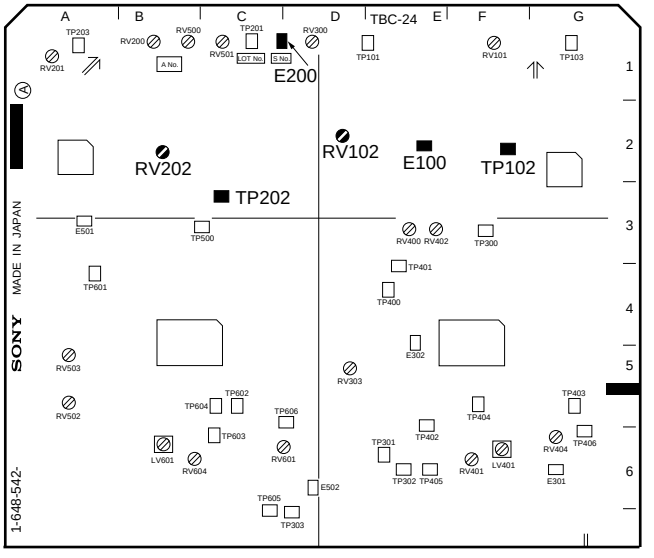
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.



TBC-24 Board (Side A) (Suffix-11 and-12)

Measurement / Adjustment

1. If the alignment tape is inserted, eject it.
2. Connect and set the oscilloscope as follows:
   CH-1: TP202/TBC-24(C-3), 500 mV/DIV
   GND: E200/TBC-24(C-1)
   CH-2: TP102/TBC-24(F-2), 500 mV/DIV
   GND: E100/TBC-24(E-2)
   TIME: 10 µs
3. Set each GND level of the oscilloscope's CH-1 and CH-2 to the oscilloscope's scale.
4. Set the oscilloscope to CH-1 display mode.
5. Turn off the power of VTR, than wait for more than 1 minute.
6. Just after turning on the power, measure the DC level of CH-1 (TP202) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for C)
7. Turn the oscilloscope to CH-2 display mode.
8. Turn off the power of VTR, than wait for more than 1 minute.
9. Just after turning on the power, measure the DC level of CH-2 (TP102) on the oscilloscope, and fill up it measured level on the following table.
   (Measurement for Y)

Measurement point	Measured DC level (fill up)	Note
CH-1: TP202/TBC-24(C-3)	A = _____	C
CH-2: TP102/TBC-24(F-2)	B = _____	Y

10. Turn the oscilloscope to CH-1 display mode.
11. During play back the alignment tape in PLAY mode, adjust the DC level of CH-1 (TP202) on the oscilloscope. (Adjustment for C)
    PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
    Adj. point: ◓RV202/TBC-24(B-2)
    Specification: Measured DC level = A (in step 6)
12. Turn the oscilloscope to CH-2 display mode.
13. During play back the alignment tape in PLAY mode, adjust the DC level of CH-2 (TP102) on the oscilloscope. (Adjustment for Y)
    PB portion: The same as step 11
    Adj. point: ◓RV102/TBC-24(D-2)
    Specification: Measured DC level = B (in step 9)
14. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent "2-10-21. VCO Lock-in Range Adjustment".

2-10-21. VCO Lock-in Range Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the power.

2. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

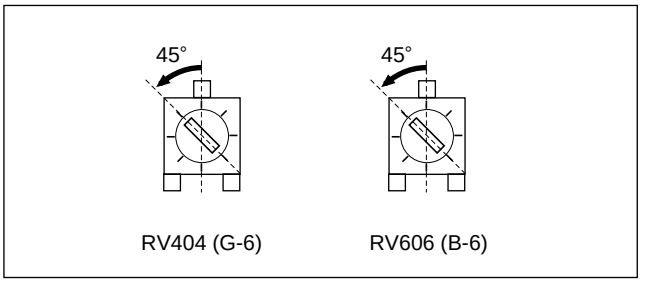
KEY INHIBIT switch ⇨ OFF

4. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and oscilloscope through the power for 20 minutes or more.

Adjustment

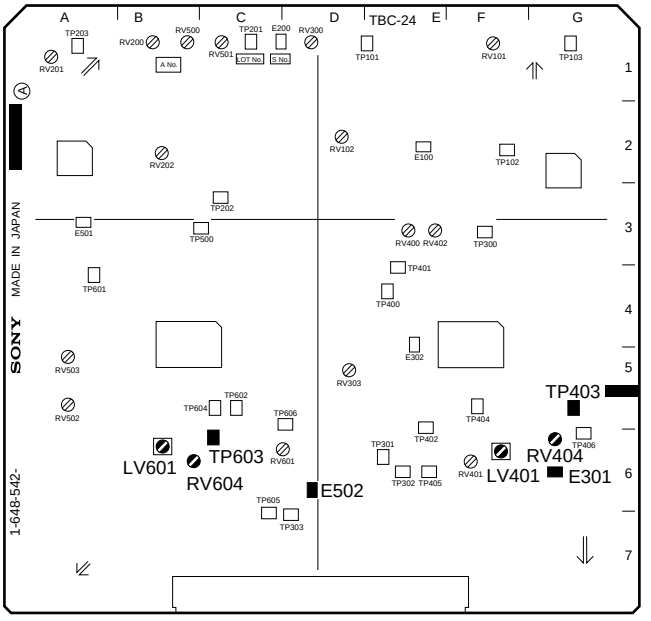
1. In the TBC-24 board of board number suffix -11 or -12, set the following RVs on the TBC-24 board to each specified position as shown figure below.



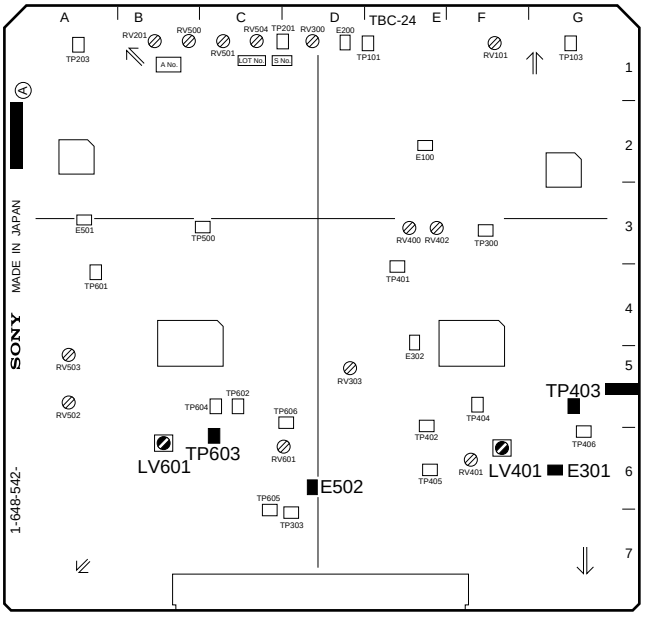
2. Connect and set the oscilloscope as follows:
   CH-1: TP403/TBC-24(G-5), DC 1 V/DIV
   GND: E301/TBC-24(G-6)
   CH-2: TP603/TBC-24(C-6), DC 1 V/DIV
   GND: E502/TBC-24(D-6)
3. During play back the alignment tape in PLAY mode, adjust each DC level of Y and C.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
   Adj. points: Y (CH-1): ⊘LV401/TBC-24(F-6)
   C (CH-2): ⊘LV601/TBC-24(B-6)
   Specification: 2.0 ±0.2 V dc
4. Stop the playback of the alignment tape.

Note

It is not necessary to eject the alignment tape when perform subsequent “2-10-22. TBC VCO Free-running Adjustment”.



TBC-24 Board (Side A) (Suffix-11 and-12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

2-10-22. TBC VCO Free-running Adjustment

Note

If RV303 on the TBC-24 board is replaced or it is turned by mistake, be sure to perform this adjustment, Section 2-10-24, and later.

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
- Shorting clip

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the power.

2. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the setting on the sub control panel.

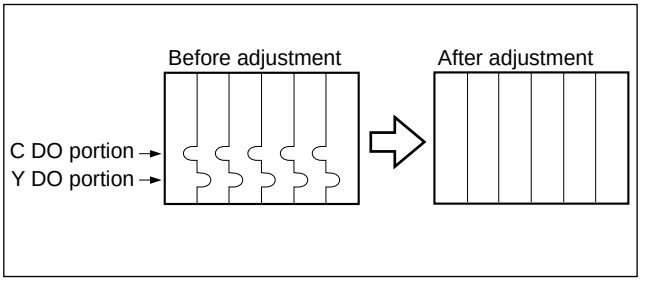
CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

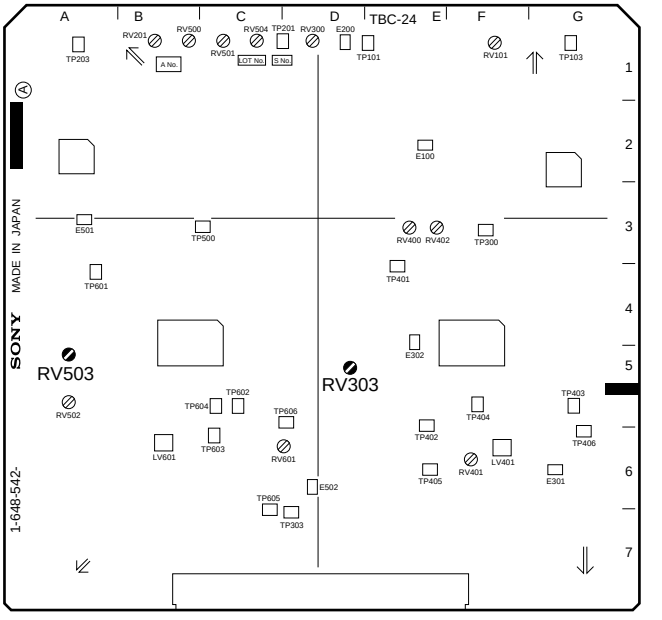
1. During play back the alignment tape in VARIABLE ×1 mode, check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out. If drop-out is appeared, adjust the following RVs.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
   Adj. points: Y DO: ⊘RV303/TBC-24(D-5)
   C DO: ⊘RV503/TBC-24(A-5)
   Specification: No dorp-out (on C DO and Y DO)



2. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent “2-10-23. FAST VCO Tracking Adjustment”.



TBC-24 Board (Side A)

2-10-23. FAST VCO Tracking Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tapes

  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)

  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)

Preparation

1. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

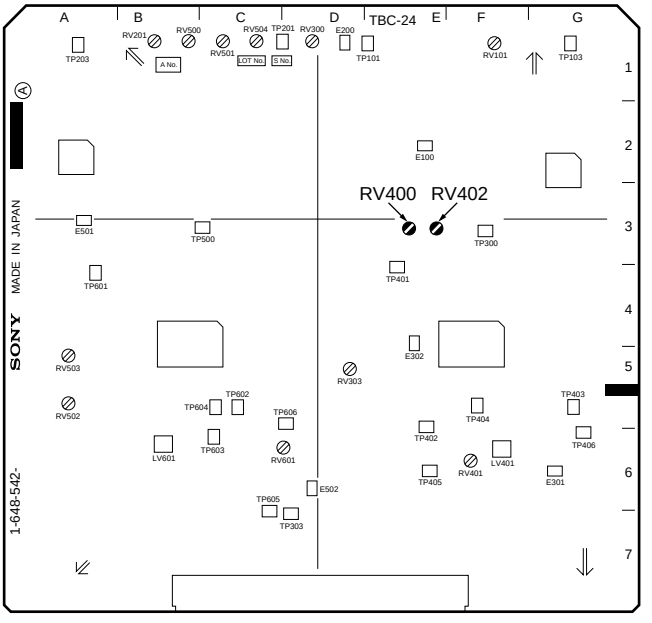
Before removing TBC-24 board, turn off the power.

2. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

3. Check the settings on the sub control panel.

CHARACTER switch ⇨ OFF
KEY INHIBIT switch ⇨ OFF



TBC-24 Board (Side A)

4. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

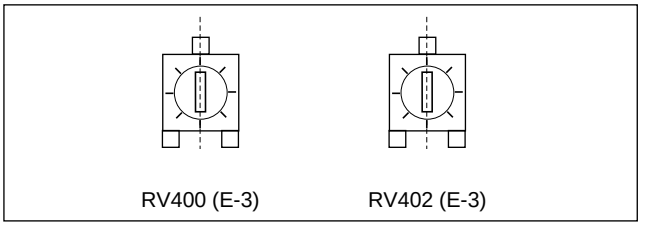
Adjustment

1. Set the following RVs on the TBC-24 board to each specified position as shown figure below.

   Note

   RV400 and RV402 are not equipped according to the model and the board number suffix of the TBC-24 board.

Suffix	RV400	RV402
11, 12, 13	With RV	With RV
14 and higher	Without RV	With RV for DNW-A65 Without RV for DNW-A65P



2. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: Color-bar signal (14:00 to 17:00) of CR5-1B / CR5-1B PS
3. During play back the alignment tape in SHUTTLE −24 time speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
4. During play back the alignment tape in range from VARIABLE −10 time speed to fastest + speed, check that the vertical lines of picture (color-bar) on the video monitor displays straight.
   If vertical lines are not straight, adjust RV402 on the TBC-24 board when RV402 is equipped.
   PB portion: The same as step 2
5. Eject the alignment tape.
6. During play back the alignment tape in FF mode and REW mode, check that the picture (color-bar) displays on the video monitor.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
7. Eject the alignment tape.

2-10-24. PB Video Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component video signal generator:
  TEKTRONIX TSG-300 or equivalent

Note

It is required that the component video signal generator is able to output the 50% bowtie signal.

- Analog composite waveform/vector monitor:
  For DNW-A65: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A65P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (5 pieces)

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A Board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in “2-10-2. Common Preparation”.)

3. Stop the extending of the board.

Do not use the extension board in this adjustment.

Note

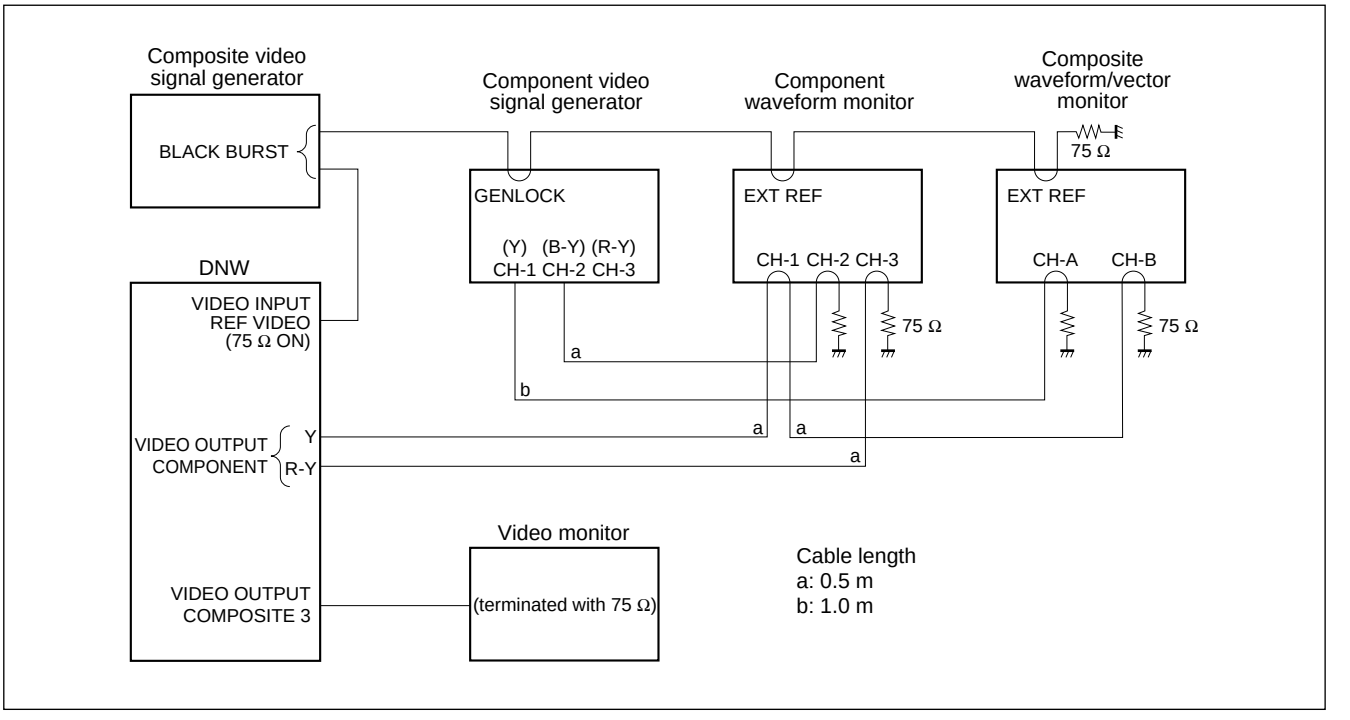
Before removing board, turn off the power.

4. Connect the equipment.

(Refer to Figure “Connection”.)
Set a output of the analog component video signal generator to 50% bowtie signal.

5. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)



Connection

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP / BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

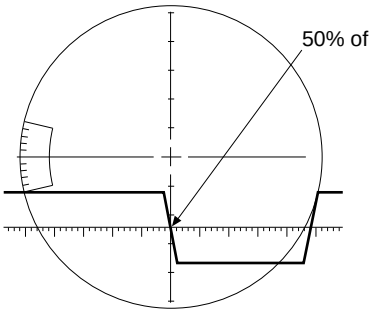
1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of "SQ Y RZ" is the following data value.
   DNW-A65: 4B, DNW-A65P: 4A
   If not, set it to above data.
4. To perform the tape operation, press the SET button once.

2. Set the System SYNC Position/Phase

1. Set the composite waveform/vector monitor as follows: WAVEFORM mode, SWEEP: 2H, MAG ON, INPUT: CH-A, EXT REF
2. Display the H SYNC part of CH-A on the composite waveform/vector monitor, and align 50% position at falling edge readability. (See Figure in step 4.)
3. Change the watching signal (channel) on composite waveform/vector monitor to CH-B.
4. During play back the alignment tape in PLAY mode, adjust the 50% position at falling edge of the H SYNC of CH-B to the identical position as CH-A using the SYNC control VR on the sub control panel.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS

Composite waveform/vector monitor (WAVEFORM mode)



5. Stop the playback of the alignment tape.
6. Set the composite waveform/vector monitor as follows: SCH mode, INPUT: CH-A, EXT REF
7. Align the SYNC phase of CH-A to 0 degree using the PHASE knob of the composite waveform/vector monitor. (See Figure in step 9.)

Note

Turn the PHASE knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.

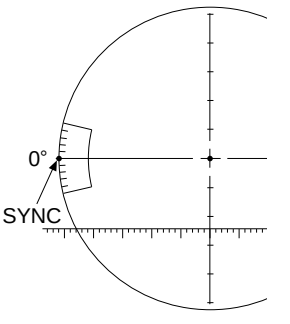
8. Change the watching signal (channel) on the composite waveform/vector monitor from CH-A to CH-B.
9. During play back the alignment tape in PLAY mode, adjust the SYNC (beam spot) of CH-B to 0 degree (the identical position as CH-A) using the SC control VR on the sub control panel.
   PB portion: The same as step 4

Note

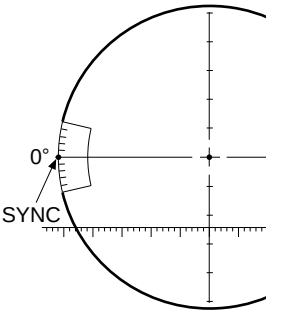
Turn the SC control VR so that the beam spot (SYNC) moves in the shortest route to 0 degree.

Composite waveform/vector monitor (SCH mode)

DNW-A65



DNW-A65P

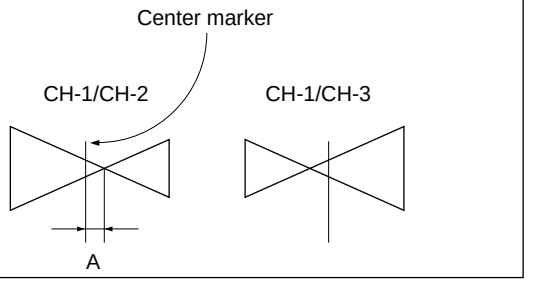


10. Stop the playback of the alignment tape.

3. Y Phase Adjustment

1. Set the component waveform monitor to BOWTIE mode.
2. During play back the alignment tape in PLAY mode, adjust the deviation between the center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y).
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV300/TBC-24 (D-1)
   Specification: A = 0 ±10 ns
   If the specification is not satisfied by adjustment, perform steps (1) through (5), before readjusting.

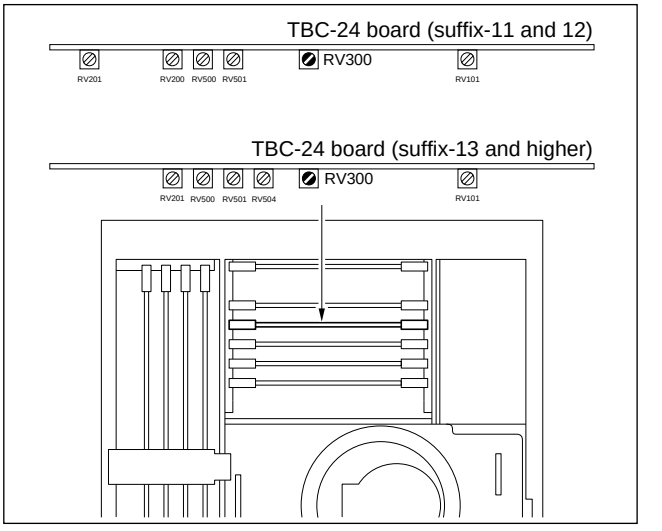
Composite waveform/vector monitor (BOWTIE mode)



If the specification in step 2 is not satisfied only, perform the following steps (1) through (6).

(1) Set RV300 on the TBC-24 board to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item “SQ Y RZ” within +1 or −1 so that the bowtie dip point moves closer to the center marker.
   And make a note of the changed data value.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 2 again.

3. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “2-10-25. TBC Y/C Delay Rough Adjustment”.
4. To operate the maintenance mode, press the MENU button once.
5. To exit A37 : TBC VR, press the MENU button once.



RV300 on TBC-24 Board

http://getMANUAL.com

Data save (Store the adjusted data)

When the data of “SQ Y RZ” in A37 : TBC VR was not changed, skip over to step 8.

6. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   - Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
7. To exit A3F : NV-RAM CONTROL, press the MENU button once.

8. To exit the maintenance mode, press the MENU button three times.

When the data of “SQ Y RZ” in A37 : TBC VR was changed in step (4), perform step 9 and later.

9. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.) And switch the video system of the video monitor.
10. To enter the maintemance mode, press S1101(L-1) on the SS-83 board.
11. Enter A37 : TBC VR.
12. Set the item “SQ Y RZ” to the data that is subtracted 1 from an noted letest date in step (4).
13. To exit A37 : TBC VR, press the MENU botton.
14. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
15. To exit the maintenance mode, press the MENU botton four times.
16. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the monitor.
    DNW-A65: 525/60 system (NTSC)
    DNW-A65P: 625/50 system (PAL)

2-10-25. TBC Y/C Delay Rough Adjustment

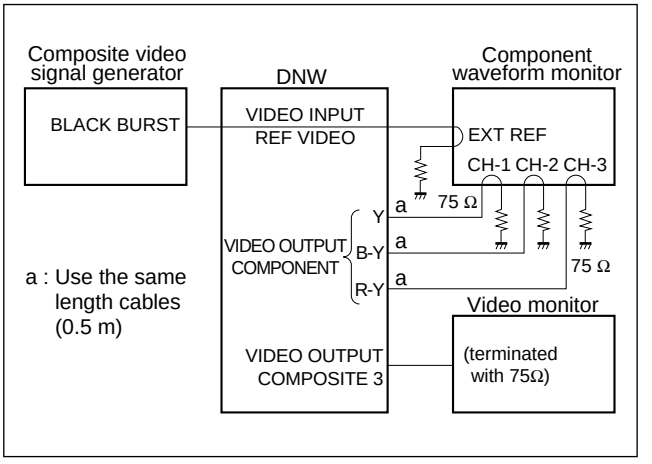
Preparing tools

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying.

- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing TBC-24 board, turn off the power.

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP / BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

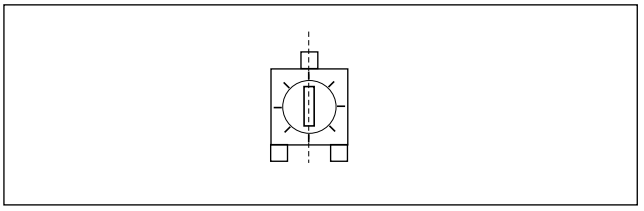
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Check the Initial Data

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of “SQ C RZ” is the following data value.
   (If not, set it to above data.)
   DNW-A65: 6F, DNW-A65P: 6E
4. To perform the tape operation, press the SET button once.

2. Adjustment

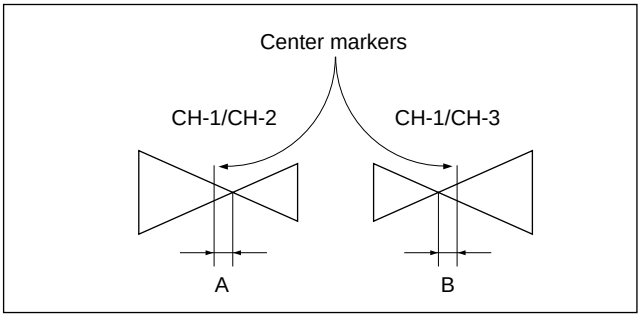
1. Set RV502/TBC-24(A-5) to the specified position as shown figure below.



2. Set the component waveform monitor to BOWTIE mode.
3. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
4. Adjust difference of deviations between each center marker and bowtie dip points of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV503/TBC-24(A-5)
   Specification: A − B = 0 ± 10 ns
   (Refer to figure at step 5.)
5. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ± 10 ns, B = 0 ± 10 ns
   If the specification is not satisfied by adjusting RV500, perform step (1) through (6).

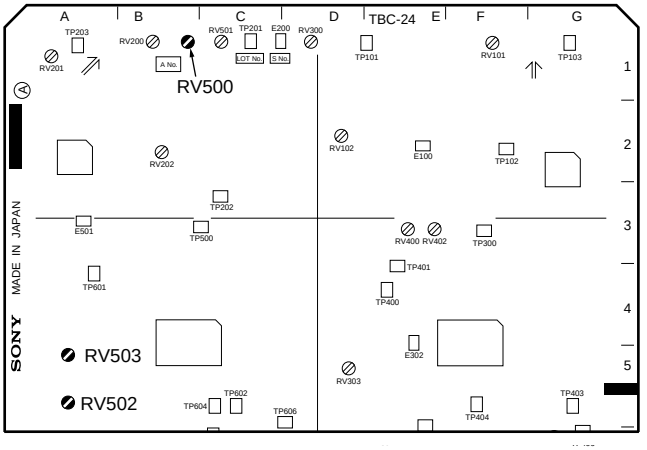
Note

As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.

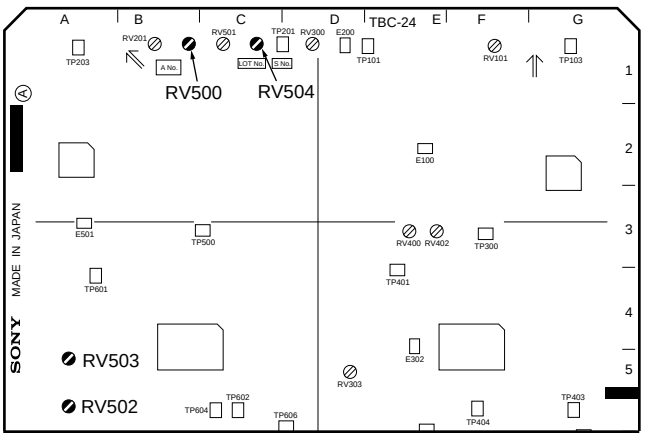


If the specification in step 5 is not satisfied only, perform following steps (1) through (6)

(1) Set RV500/TBC-24(B-1) to the mechanical center.
(2) Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 3
(3) To operate the maintenance mode, press the MENU button once.
(4) Change the data value of item “SQ C RZ” within +2 or −2 so that the bowtie dip points move closer to center markers.
   And make a note of the changed data value.
(5) To perform the tape operation, press the SET button once.
(6) Perform step 5 again.



TBC-24 Board (Side A) (Suffix-11 and -12)



TBC-24 Board (Side A) (Suffix-13 and Higher)

6. Stop the playback of the alignment tape.
   Note
   It is not necessary to eject the alignment tape when perform subsequent “2-10-26. Impact Error offset Alignment”.
7. To operate the maintenance mode, press the MENU button once.
8. To exit A37 : TBC VR, press the MENU button once.

Data save (Store the adjusted data)

When the data of “SQ C RZ” in A37 : TBC VR was not changed, skip over to step 11.

9. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.
   Note
   When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
10. To exit A3F : NV-RAM CONTROL, press the MENU button once.

11. To exit the maintenance mode, press the MENU button three times.

When the data of “SQ C RZ” in A37 : TBC VR was changed in step (4), perform step 12 and later.

12. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 6-2-2 of the operation manual.) And switch the video system of the video monitor.
13. To enter the maintemance mode, press S1101(L-1) on the SS-83 board.
14. Enter A37 : TBC VR.
15. Set the item “SQ C RZ” to the data that is subtracted 1 from an noted letest date in step (4).
16. To exit A37 : TBC VR, press the MENU botton.
17. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
18. To exit the maintenance mode, press the MENU botton four times.
19. Return the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT. And return the video system of the monitor.
    DNW-A65: 525/60 system (NTSC)
    DNW-A65P: 625/50 system (PAL)

2-10-26. Impact Error Offset Adjustment

Preparing tools

- Analog component video monitor

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension cable: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
- Alignment tape
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)

Preparation

1. Check the switch setting on the SS-83 board.
S1100-1 (M-1) ⇨ ON

2. Check the switch settings on the TBC-23A board.
Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

3. Extend the TBC-24 board with an extension board EX-377 and an extension cable (14P).

Note

Before removing the TBC-24 board, turn off the power.

4. Check the settings on the upper control panel.
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

5. Check the settings on the sub control panel.
CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
- VIDEO switch ⇨ PRESET
- CHROMA switch ⇨ PRESET
- SET UP / BLACK LEVEL switch ⇨ PRESET
- Y/C DELAY switch ⇨ PRESET
- CHROMA PHASE switch ⇨ PRESET

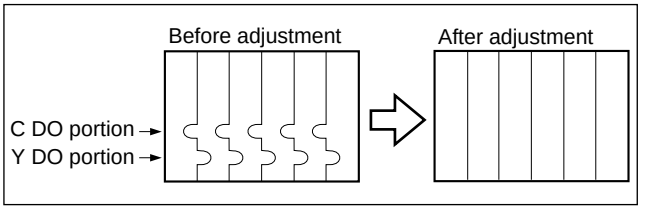
KEY INHIBIT switch ⇨ OFF

6. Check the setup extend menu settings. (DNW-A65 only)
ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

7. Check that the VTR has warmed up.
Before starting the adjustment, warm up the VTR through the power for 20 minutes or more.

Adjustment

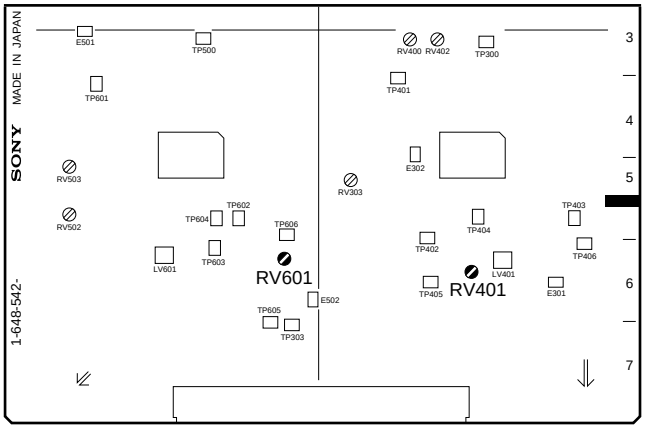
1. Start the playback of alignment tape in PLAY mode.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
2. Check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   Adj. points: Y DO: ⊘RV401/TBC-24(F-6)
   C DO: ⊘RV601/TBC-24(D-6)
   Specification: No dorp-out (on C DO and Y DO)



3. Stop the playback of the alignment tape.

   Note

   It is not necessary to eject the alignment tape when perform subsequent "2-10-27. TBC Y/C Delay Adjustment".



TBC-24 Board (Side A)

2-10-27. TBC Y/C Delay Adjustment

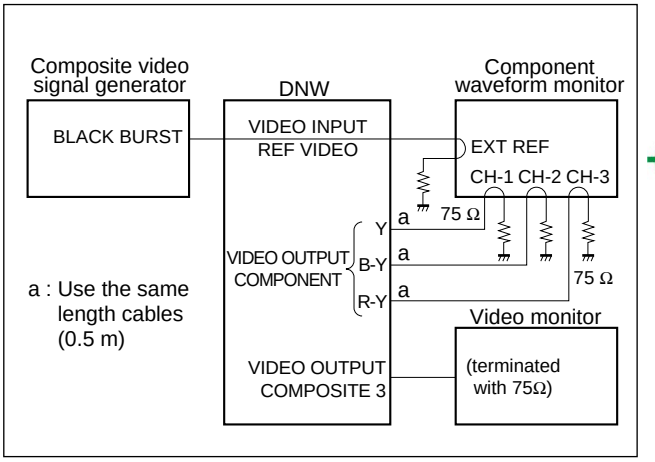
Preparing tools

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Analog component video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (4 pieces)



Connection

Preparation

1. Stop the extending of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP / BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF

7. Check the setup extend menu settings. (DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

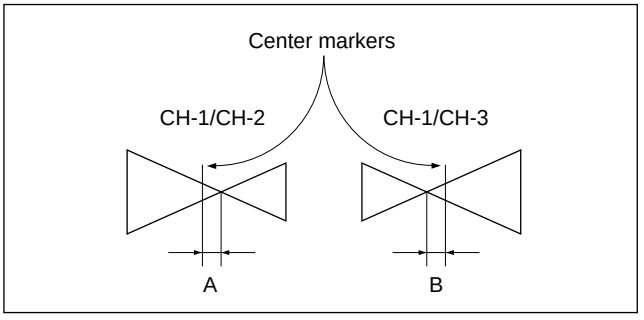
Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. METAL Adjustment

1. Set the component waveform monitor to BOWTIE mode.
2. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
3. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1: ⊘RV500/TBC-24(B-1)
   Field 2: ⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns

   Note

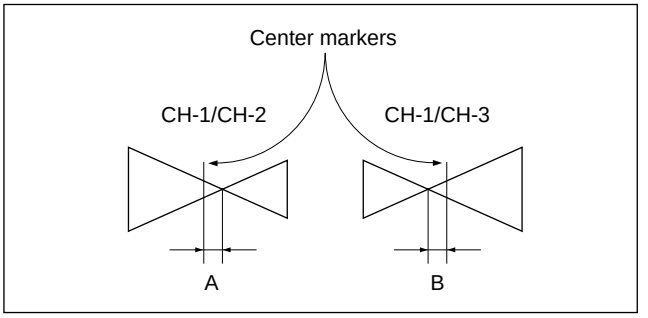
   As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.



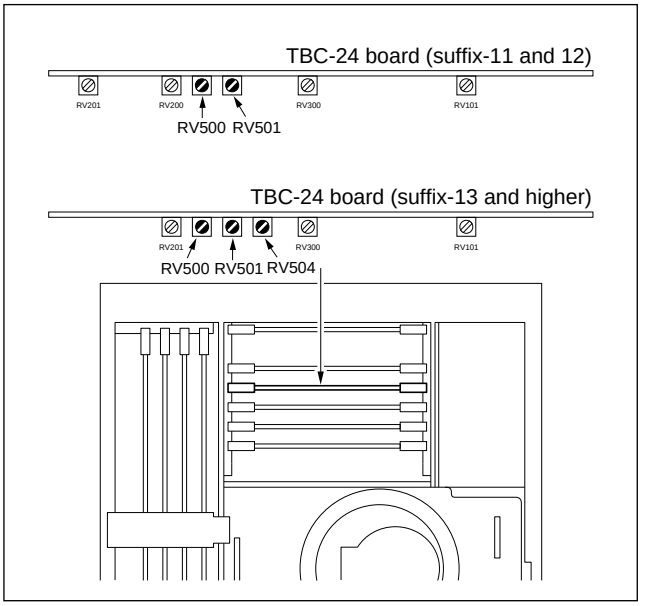
4. Eject the alignment tape.

2. OXIDE Adjustment

1. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (6:00 to 9:00) of CR5-2A / CR5-2A PS
2. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV501/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns



3. Eject the alignment tape.



RV500, RV501, and RV504 on TBC-24 Board

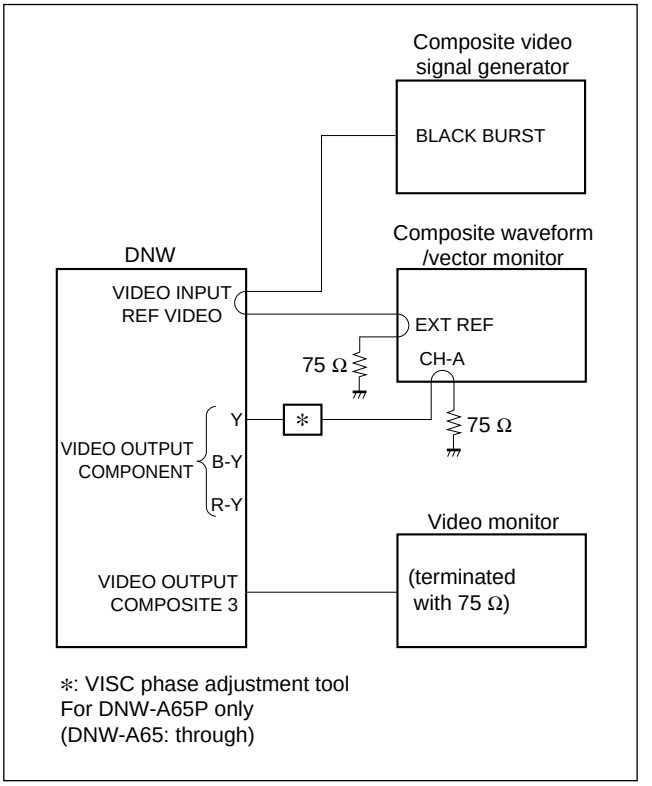
2-10-28. VISC Phase Adjustment

Preparing tools

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog composite waveform/vector monitor:
  For DNW-A65: TEKTRONIX 1750, 1780R, or equivalent
  For DNW-A65P: TEKTRONIX 1751, 1781R, or equivalent
- Analog component video monitor

  Note

  This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tapes
  For DNW-A65: CR5-1B (Part No. 8-960-096-41)
  For DNW-A65P: CR5-1B PS (Part No. 8-960-096-91)
- 75 Ω terminators (2 pieces)



Connection

Preparation

1. Stop the extension of the board.

Be sure to perform the adjustment without using the extension board.

Note

Before removing the board, turn off the power.

2. Check the switch setting on the SS-83 board.

S1100-1 (M-1) ⇨ ON

3. Check the switch settings on the TBC-23A board.

Reset the switch settings on the TBC-23A board to the factory settings.
(Refer to step 1 in "2-10-2. Common Preparation".)

4. Connect the equipment.

(Refer to Figure "Connection".)

5. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

6. Check the settings on the sub control panel.

CHARACTER switch ⇨ ON
PROCESS CONTROL switch ⇨ LOCAL
• VIDEO switch ⇨ PRESET
• CHROMA switch ⇨ PRESET
• SET UP / BLACK LEVEL switch ⇨ PRESET
• Y/C DELAY switch ⇨ PRESET
• CHROMA PHASE switch ⇨ PRESET
KEY INHIBIT switch ⇨ OFF
CAPSTAN LOCK switch ⇨ 2FD

7. Check the setup extend menu settings. (DNW-A65 only)

ITEM-709 : CAV LEVEL FORMAT
1. OUTPUT CAV LEVEL ⇨ B-CAM
ITEM-713 : VIDEO SETUP REFERENCE LEVEL
0. MASTER LEVEL ⇨ 0.0%
3. BETACAM PB LEVEL ⇨ MSTER
4. OUTPUT LEVEL ⇨ MSTER

8. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and other equipment through the power for 20 minutes or more.

1. Enter the Maintenance Mode and Check the Initial Data

1. To enter the maintenance mode, press S1101 (L-1) on the SS-83 board.
2. Enter A37 : TBC VR.
3. When the TBC-23A board or NV-RAM (IC200/TBC-23A) was replaced only, check that the data of “VISC PHASE” is the following data value.
   DNW-A65: 05, DNW-A65P: 03
   If not, set it to above data.
4. To perform the tape operation, press the SET button once.

2. Adjustment

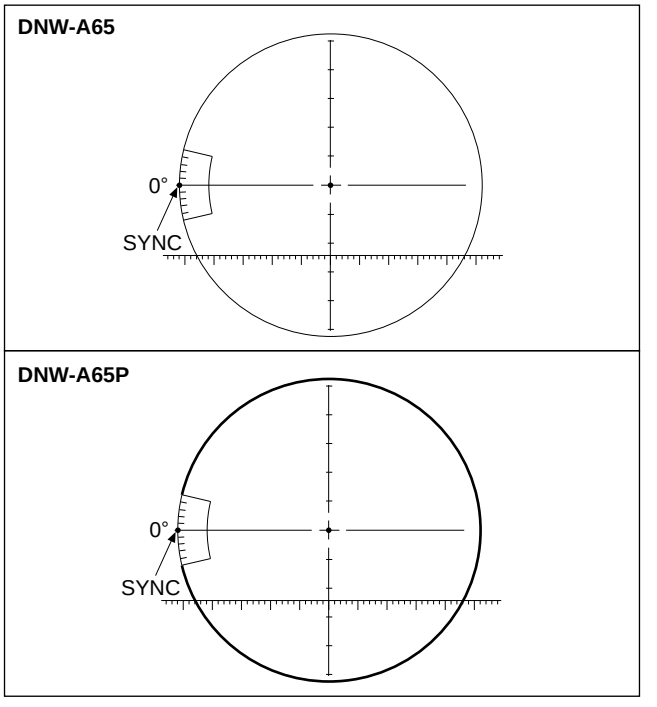
1. Set the composite waveform/vector monitor as follows:
   SCH mode, INPUT: CH-A, EXT REF
2. Start the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: H sweep signal with VISC signal (28:00 to 30:00) of CR5-1B / CR5-1B PS

   Note

   To confirm that the specifications are satisfied in step 8 within two minutes after starting the playback, be sure to complete the working in a short time.
   If the playback signal is changed another on steps to step 9, return to step 2 and restart.
3. Set the CAPSTAN LOCK switch on the sub control panel as follows, then return it to 2FD after 2 seconds.
   DNW-A65: 4FD, DNW-A65P: 8FD
4. Set the SYNC to 0 degree using PHASE control knob of the composite waveform/vector monitor.

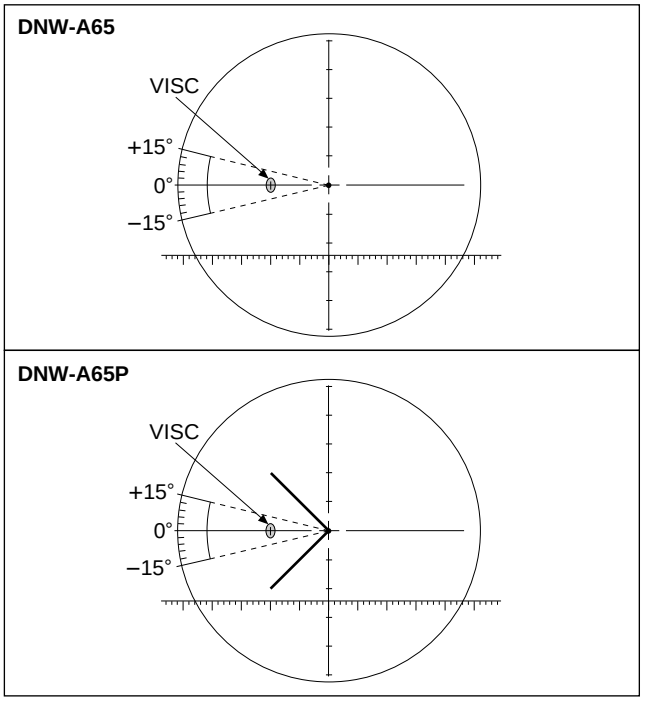
   Note

   Turn the PHASE control knob so that the beam spot (SYNC) moves in the shortest route to 0 degree.



Composite waveform/vector monitor (SCH mode)

5. Set the composite waveform/vector monitor as follows:
   DNW-A65: VECTOR mode, Line select: 11, EXT REF
   DNW-A65P: VECTOR mode, Line select: 8, EXT REF
6. Align the center position of VISC (beam spot) to 0 degree with PHASE knob of the composite waveform/vector monitor.
   Note
   Turn the PHASE knob so that the beam spot (VISC) moves in the shortest route to the specified position.
7. Set the CAPSTAN LOCK switch on the sub control panel as follows:
   DNW-A65: 4FD, DNW-A65P: 8FD
8. Adjust the center position of VISC (beam spot).
   Adj. point: ⊘RV200/TBC-23A (C-1)
   Specifications: Center of beam spot: 0 ±5°
   Jitters of beam spot: 0 ±15°
   If the specification is not satisfied, readjust after performing steps (1) through (4) on next page.



Composite waveform/vector monitor (VECTOR mode)

If the specification in step 8 is not satisfied only, perform steps (1) through (5).

(1) Set RV200 on the TBC-23A board to the mechanical center.
(2) To operate the maintenance mode, press the MENU button once.
(3) Change the data value of item “VISC PHASE” within +1 or −1 so that the center of VISC (beam spot) moves closer to 0 degree.
(4) To perform the tape operation, press the SET button once.
(5) Perform step 8 again.

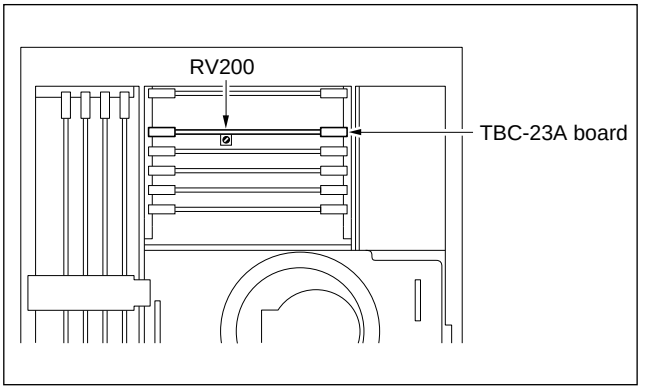
9. Stop the playback of the alignment tape, and eject it.
10. To operate the maintenance mode, press the MENU button once.
11. To exit A37 : TBC VR, press the MENU button once.

Data save (store the adjusted data)

When the data of “VISC PHASE” in A37 : TBC VR was not changed, skip over to step 14.

12. Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
    • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.
    Note
    When loading the previous data without save the current adjusted data, execute “ALL DATA PREVIOUS”.
13. To exit A3F : NV-RAM CONTROL, press the MENU button once.

14. To exit the maintenance mode, press the MENU button three times.



RV200 on TBC-23A Board

http://getMANUAL.com

2-11. SDI/SDTI Output Line Adjustment

2-11-1. Adjustment Overview

In the electrical adjustments for the SDI/SDTI output, adjust each VCO free-running frequency for the encoders using the menu in the maintenance mode.
Usually perform the automatic adjustment of Section 2-11-2. If the manually adjustment is needed, refer to Section 2-11-3.

Notes

- The DNW-A65/65P is applied the SDTI output function by adding an optional kit BKNW-118.
- For detail of each menu in the maintenance mode, refer to Section 4 of the maintenance manual part 1.

Tools list

To perform the electrical adjustments for the SDI/SDTI output lines, prepare the following equipment.

Note

Manually adjustment is not needed when the automatic adjustment can be is performed in the VTR.

When performing the automatic adjustment

- Analog composite video monitor

When performing the manually adjustment

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Adjustment Items

Since above adjustment items can be adjusted independently of each other, no special order has been observed.

Line	Item	Adjustment point	Measurement point for manually adj.
SDI outputs	Encoder1 VCO free-running freq. adj.	A231 : SDI ENC1 VCO	TP201/SDI-41
	Encoder2 VCO free-running freq. adj.	A232 : SDI ENC2 VCO	TP201/SDI-41
SDTI output	Encoder VCO free-running freq. adj.	A234 : SDTI ENC VCO *1	TP1/DPR-119
	Data save	A2F : NV-RAM CONTROL	

*1: This is displayed when the DPR-119 board is installed.
For the optional kit BKNW-118 (DPR-119 board)

2-11-2. VCO Free-running Frequency Automatic Adjustment

Preparing tool

- Analog composite video monitor

Note

This video monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.

CHARACTER switch ⇨ ON

2. Check that the VTR has warmed up.

Before starting the adjustment, warm up the VTR through the power for 10 minutes or more.

Automatic Adjustment

1. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
2. Enter A23 : CP VR in the maintenance mode.
3. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
4. Change the adjustment mode to the automatic. (Change the massage to "Auto (Push SET button)".)

   Note

   How to change the adjustment mode from the manual to the automatic:
   When there is the ∗-mark to ahead of "Manual", turn the search dial in FORWARD (↻) direction while pressing the JOG button. (In the time data display area, "PUSH SET" is displayed.)
5. To execute the automatic adjustment, press the SET button once.
   - The displayed message on the video monitor changes to "Auto Adjusting ...". The displayed data value also changes.
     The display in the time data display area does not change. ("PUSH SET" in it remain displayed.)
6. Confirm the automatic adjustment completion on the video monitor.
   - Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

   Note

   If message "Auto Adjust Failure" is displayed, refer to the "For Automatic Adjustment Failure" below.
7. To exit the sub menu, press the MENU button once.

   Note

   Go to step 3 in order to perform other VCO free-running frequency adjustment.
8. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

9. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
   - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

   Note

   When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".

10. To exit the maintenance mode, press the MENU button four times.

For Automatic Adjustment Failure

In the sub menu A231 or A232

Confirm that no abnormality exists in the cable connecting the SDI output connectors on the SDI-41 board and rear panel.
If no abnormality is found in the connection, the SDI-41 board is considered to be defective.

In the sub menu A234

Confirm that no abnormality exists in the cable connecting the SDTI output connectors on the DPR-119 board and rear panel.
If no abnormality is found in the connection, the DPR-119 board is considered to be defective.

2-11-3. VCO Free-running Frequency Manually Adjustment

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (Part No. A-8277-211-A)
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

Preparation

1. Check the setting on the sub control panel.
CHARACTER switch ⇨ ON

2. Extend the DPR-118 board with an extension board EX-555.

Note

Before removing DPR-118 board, turn off the power.

3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and other equipment through the power for 10 minutes or more.

Manual Adjustment

1. Set the oscilloscope as follows:
   CH-2: DC 2 V/DIV
   TIME: 100 µs/DIV
2. Connect the frequency counter's input to the oscilloscope's CH-2 output.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A23 : CP VR of the maintenance mode.
5. Enter the following specified sub menu.
   SDI output1/2: A231 : SDI ENC1 VR
   SDI output3: A232 : SDI ENC2 VR
   SDTI output: A234 : SDTI ENC VR (for BKNW-118)

   Note

   In this time, the adjustment mode is the manual, and "Manual" is displayed on the video monitor. (In the time data display area, "MANUAL" is displayed.)
6. Turn the search dial in FORWARD (↻) direction to move the ∗-mark to the line of the adjustment data. (Displays the item title in the time data display area, "SDI ENC1" for example.)
7. Connect the osilloscope's CH-2 input as follows:

For SDI output	TP201/SDI-41 (E-1) GND : E6/SDI-41 (B-1)
For SDTI output	TP1/DPR-119 (A-3 of side B) GND : E1/DPR-119 (C-4 of side B)

8. Change the data until the indicated frequency on the frequency counter satisfy the specification.
   Specification: 27.00 ±0.10 MHz

   Note

   How to change the adjustment data:
   Turn the search dial while pressing the JOG button.
9. To exit the sub menu, press the MENU button once.

   Note

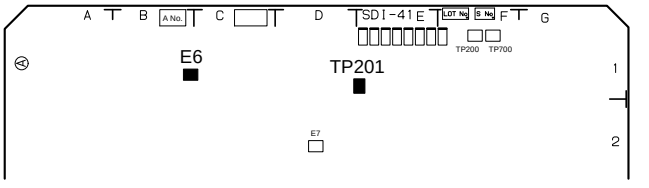
   Go to step 5 in order to perform other VCO free-running frequency adjustment.
10. To exit the menu of A23 : CP VR, press the MENU button once again.

Data save (store the adjusted data)

11. Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
12. To exit the maintenance mode, press the MENU button four times.



SDI-41 Board (Side A)

2-12. TBC Remote Control Offset Adjustment (FP-117 Board)

When the CAV control level conversion circuit (about IC7 to IC10) on the FP-117 board was repaired, perform this adjustment.

Note

Before attaching the panel of the upper control panel, perform this adjustment.

Tools

- Digital voltmeter: ADVANTEST TR6845 or equivalent
- Something to short-circuit the D-SUB connector's pins

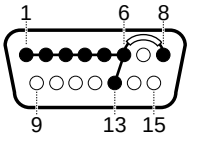
  Note

  There is a convenient with the shorting connector as follows:

  Used component:

  D-SUB connector (female) (Part No. 1-561-610-21)

Short the pins through 6, 8, and 13 of the connector.



Note: Be sure to connect the pin 8 with the covered wire.

Shorting Connector

Preparation

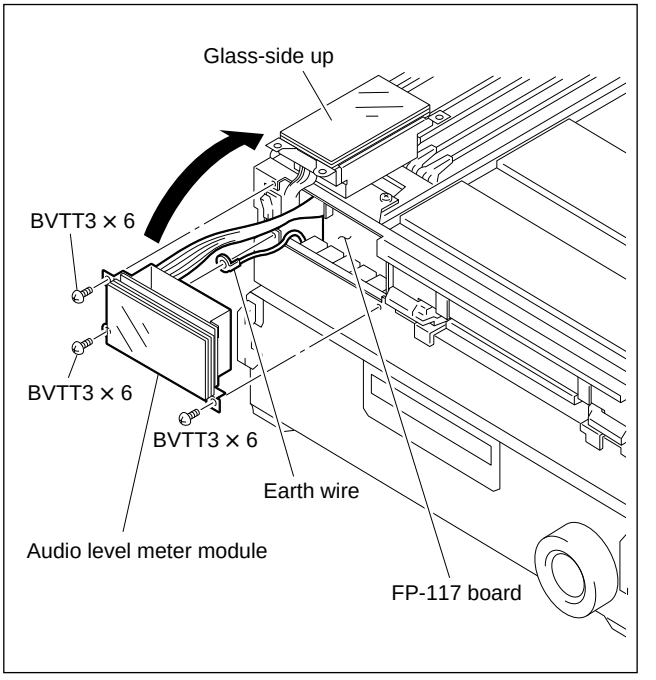
1. If the upper control panel was reattached, remove it. (Refer to Section 2-3-2 of the maintenance manual part 1.)
2. Unscrew the three screws and remove the audio level meter module.

   Note

   There is glass part in the module. Be sure to handle with care.
3. Disconnect the harness from the audio level meter module.

   Note

   Be sure place the audio level meter module on the its glass-side up.



Removing of Audio Level Meter Module

4. Connect the power cord. (POWER switch is OFF.)
5. Turn on the power and warm up the VTR and digital voltmeter through the power for 20 minutes or more.

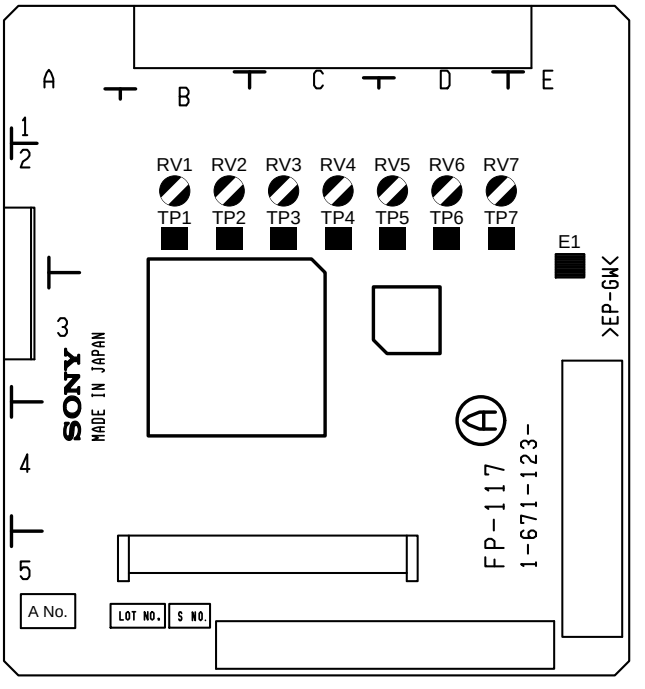
Adjustment without the Shorting Connector

Note

Be sure to short-circuit VIDEO CONTROL connector's pins in the power off.
Never short-circuit this connector's pin 7 (+12 V) or pin 15 (−12 V) to other pin.

1. Turn off the power.
2. Short-circuit VIDEO CONTROL connector's pin 8 (GND) to one of the satisfied pin on the table below.
3. Turn on the power.
4. Connect the digital voltmeter to the specified measurement point on the table below.
5. Adjust the voltage on the digital voltmeter.
   Adj. points: Refer to table below.
   Specification: 2.500 ±0.001 V dc
6. Repeat from step 1 until completing the adjustments for all adjustment points.

Pin No. to short-circuit (Adjusting item)	Measurement point	Adjustment point
1 (SYNC PHASE)	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
2 (CHROMA PHASE)	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
3 (SC PHASE)	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)
4 (VIDEO LEVEL)	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
5 (SETUP/BLACK LEVEL)	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
6 (CHRAMA LEVEL)	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
13 (Y/C DELAY)	TP4/FP-117(C-2)	⊘RV4/FP-117(D-2)



FP-117 Board (Side A)

Adjustment with the Shorting Connector

Note

Be sure to connect the shorting connector in the power off.

1. Turn off the power.
2. Connect the shorting connector to VIDEO CONTROL connector.
3. Turn on the power.
4. Adjust each voltage on the digital voltmeter.
   Measure. point: Refer to the table below.
   Adj. point: Refer to the table below.
   Specification: 2.500 ±0.001 V dc

Adjusting item	Measurement point	Adjustment point
VIDEO LEVEL	TP1/FP-117(B-2)	⊘RV1/FP-117(B-2)
CHRAMA LEVEL	TP2/FP-117(B-2)	⊘RV2/FP-117(B-2)
SETUP/BLACK LEVEL	TP3/FP-117(C-2)	⊘RV3/FP-117(C-2)
Y/C DELAY	TP4/FP-117(C-2)	⊘RV4/FP-117(D-2)
CHROMA PHASE	TP5/FP-117(D-2)	⊘RV5/FP-117(D-2)
SYNC PHASE	TP6/FP-117(D-2)	⊘RV6/FP-117(D-2)
SC PHASE	TP7/FP-117(D-2)	⊘RV7/FP-117(D-2)

Perfection

1. Turn off the power.
2. Reinstall the audio level meter module.
   (Perform in the reverse steps 2 and 3 of "Preparation".)
   Notes
   - This module's displaying side is glass. Be sure to handle with care.
   - Fix the earth wire and this module (its left part) together .
3. Reattach the panel for the upper control panel.
4. When the shorting connector was used, remove it.

2-13. LTC Alignment (TC-102 Board)

2-13-1. Adjustment Overview

When the TC-102 board is repaired or replaced, perform the time code system alignment.

Be sure to adjust in the following video system.
DNW-A65: 525/60 system
DNW-A65P: 625/50 system

Note

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

Tools List

To perform the time code system alignment for the VTR, prepare the following equipment and fixtures.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Alignment tape
  For DNW-A65: SR5-1 (Part No. 8-960-075-01)
  For DNW-A65P: SR5-1P (Part No. 8-960-075-51)
- Recorded SX tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

  Note

  Be sure to prepare a Betacam SX cassette tape that recorded the time code to the TC track using a Betacam SX videocassette recorder in advance.

Adjustment Items

Section	Item (Section title)	Adjustment point	Measurement point
2-13-2	LTC playback level check	—	TP102/TC-102(A-2)
2-13-3	LTC recording level check	—	TP100/TC-102(A-3), TP101/TC-102(A-2)
2-13-4	LTC erasure current adjustment	⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)

Common Preparation

Perform the settings of control panels' switch, before starting the adjustments.
Return the all settings to the customer settings after completing the alignment.

Part	Item		Customer setting	Setting at adjustment
Upper control panel	TC (LTC/AUTO/VISC)		_____	⇨ LTC
	REMOTE:	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	GOOD SHOT switch		_____	⇨ REC
	KEY INHIBIT switch		_____	⇨ OFF

2-13-2. LTC Playback Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Alignment tape
  For DNW-A65: SR5-1 (Part No. 8-960-075-01)
  For DNW-A65P: SR5-1P (Part No. 8-960-075-51)

Preparation

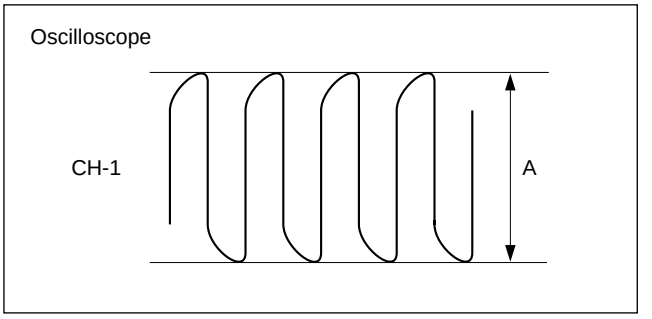
1. Check the settings on the upper control panel.
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the setting on the sub control panel.
KEY INHIBIT switch ⇨ OFF

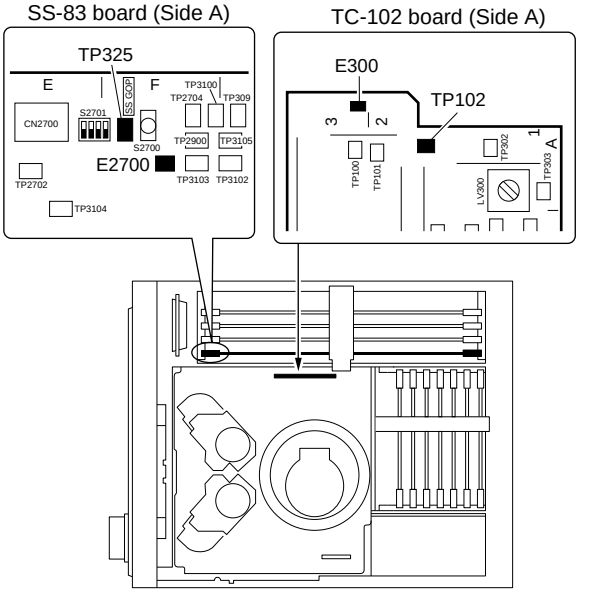
3. Check that the equipment has warmed up.
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Playback Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP102/TC-102(A-2), DC 100 mV/DIV
   GND: E300/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the alignment tape SR5-1/SR5-1P.
3. During play back the alignment tape in the following PB modes, check each level on the oscilloscope.
   PB modes: PLAY
   REW
   SHUTTLE (−5 times speed)
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)



4. Eject the alignment tape.



2-13-3. LTC Recording Level Check

Preparing tools

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Recorded SX tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

Be sure to prepare a Betacam SX cassette tape that recorded the time code to the TC track using a Betacam SX videocassette recorder in advance.

Preparation

1. Check the settings on the upper control panel.

LTC/AUTO/VISC ⇨ LTC
REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the settings on the sub control panel.

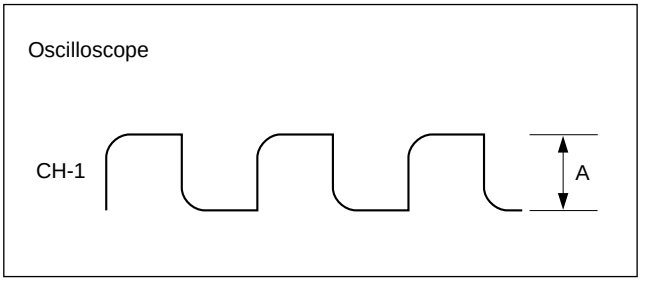
KEY INHIBIT switch ⇨ OFF
GOOD SHOT switch ⇨ REC

3. Check that the equipment has warmed up.

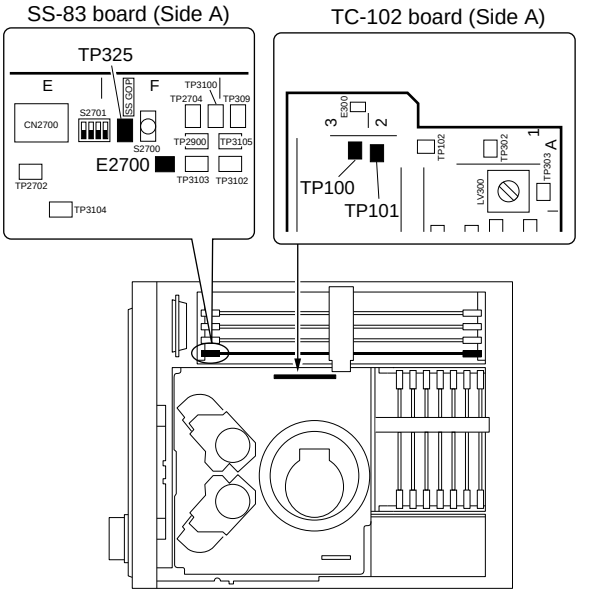
Before starting the adjustment, warm up the VTR and oscilloscope through the power for 10 minutes or more.

Recording Level Check

1. Set and connect the oscilloscope as follows:
   CH-1: TP100/TC-102(A-2), DC 100 mV/DIV
   GND: TP101/TC-102(A-3)
   TIRG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 µs/DIV
2. Insert the recorded SX tape.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A5 : LTC REC ADJUST MODE.
   - Message "Record start (Push SET)" is displayed on the video monitor.
5. To start the recording, press the SET button.
   - The REC/ERASE indicator on the lower control panel lights, and the message "Recording" is displayed on the video monitor.
6. Check the level on the oscilloscope.
   Specification: A = 60 ± 5 mV p-p



7. Eject the recorded SX tape.
8. To exit the maintenance mode, press the MENU button four times.



2-13-4. LTC Erasure Current Check

Preparing tools

- Audio level meter:
  HEWLETT-PACKARD HP3400A or equivalent
- Analog composite video monitor

Note

This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

- Recorded SX tape: BCT-SX series (Betacam SX cassette)
  (Sony's standard products)

Note

Be sure to prepare a Betacam SX cassette tape that recorded the time code to the TC track using a Betacam SX videocassette recorder in advance.

Preparation

1. Check the settings on the upper control panel.

REMOTE: 9P ⇨ Off (Light off)
50P ⇨ Off (Light off)

2. Check the settings on the sub control panel.

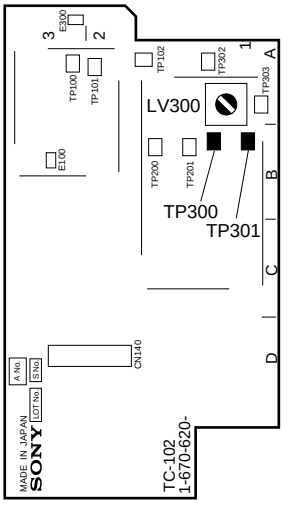
KEY INHIBIT switch ⇨ OFF
GOOD SHOT switch ⇨ REC

3. Check that the equipment has warmed up.

Before starting the adjustment, warm up the VTR and audio level meter through the power for 10 minutes or more.

Time Code Erase Bias Current Check

1. Connect the audio level meter (V rms measurement mode) to TP301(B-1) on the TC-102 board.
   GND: TP300/TC-102(B-1)
2. Insert the recorded SX tape.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A5 : LTC REC ADJUST MODE.
   - Message "Record start (Push SET)" is displayed on the video monitor.
5. To start the recording, press the SET button.
   - The REC/ERASE indicator on the lower control panel lights, and the message "Recording" is displayed on the video monitor.
6. Check the level on the audio level meter in recording on the tape.
   Adj. point: ⊘LV300/TC-102(A-1)
   Specification: Maximum (110 mV rms or more: OK)
   (Note: 40.5 ± 1.0 kHz)
7. Eject the recorded SX tape.
8. To exit the maintenance mode, press the MENU button four times.



TC-102 Board (Side A)

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Section 3
Replacement of Main Parts

This section explains the replacement procedures of periodic replacement parts, main mechanical parts, power supply unit, and circuit boards.

3-1. General Information for Parts Replacement

3-1-1. Index

The parts that are explained the replacement procedures in this section are as shown in the tables below.

(1) Mechanical parts and power supply unit

Items		Page
3-2.	Upper Drum Assembly Replacement	3-8
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3-28.	Fan Motor Replacement	3-168
3-29.	Power Supply Unit Replacement	3-175
3-31.	Board Replacement in Power Supply Unit	3-207

(2) Mounted Circuit Boards

Board name	Procedure
AC-169	Refer to the exploded views.
APR-40	Plug-in board
AU-260	Plug-in board
CCM-15	Refer to “Gear Box Assembly and Threading Motor Replacement (Section 3-21)” or “Reel Shift Motor Replacement (Section 3-18)”. It is not neccessary to remove the moter and M gear.
CL-29	Refer to the exploded views.
CP-278	Section 3-30-1 .
CP-301	Section 3-30-2.
CP-334	Section 3-30-3.
CP-335	Section 3-30-4.
DM-89	Plug-in board
DPR-118	Plug-in board
DR-315	Section 3-30-6.
DT-34D	Section 3-30-5.
EQ-75	Plug-in board
FP-117	Section 3-30-7.
KY-438	Section 3-30-8.
LP-81	Refer to the exploded views.
MB-818	Section 3-30-9.
MS-58	Section 3-30-10.
PC-70	Refer to the exploded views.
PD-35	Refer to “3-11. Pinch Solenoid Replacement”.
PTC-54	Refer to “3-21. Gear Box Assembly and Threading Moter Replacement”.
PTC-59	Refer to the exploded views. Replace by the MC sensor assembly (A-8278-312-A).
PTC-69	Refer to the exploded views. After replacement, perform the electrical adjustment (Section 2-3) before install the search dial assembly on the lower control panel.
PTC-71	Refer to the exploded views.
RM-130	Section 3-30-11.
RM-179	Section 3-30-11.
RM-181	Refer to “3-15. Reel Motor Assembly Replacement”.
SDI-41	Plug-in board
SE-344	Refer to the exploded views. Replace by the reel FG assembly (A-8278-310-A). After replacement, perform the reel table rotation sensor position adjustment (Section 3-15-7).
SE-461	Section 3-30-12.
SS-83	Plug-in board
SWC-31	Section 3-30-13.
SWC-35	Section 3-30-14.
TBC-23A	Plug-in board
TBC-24	Plug-in board
TC-102	Section 3-30-15.
TR-78	Replace by the tension regulator assembly (A-8267-795-E). (Refer to Section 3-23.)
TR-79	Section 3-30-16.
VPR-47	Plug-in board
VR-223	Section 3-30-17.
VR-224	Section 3-30-18.

- Refer to Section 2 of the maintenance manual part 1 for plug-in board replacement.
- Refer to Section 2 of the maintenance manual part 2 vol. 2 for the exploded views.

3-1-2. Threading End Mode and Unthreading End Mode

1. Threading End Mode

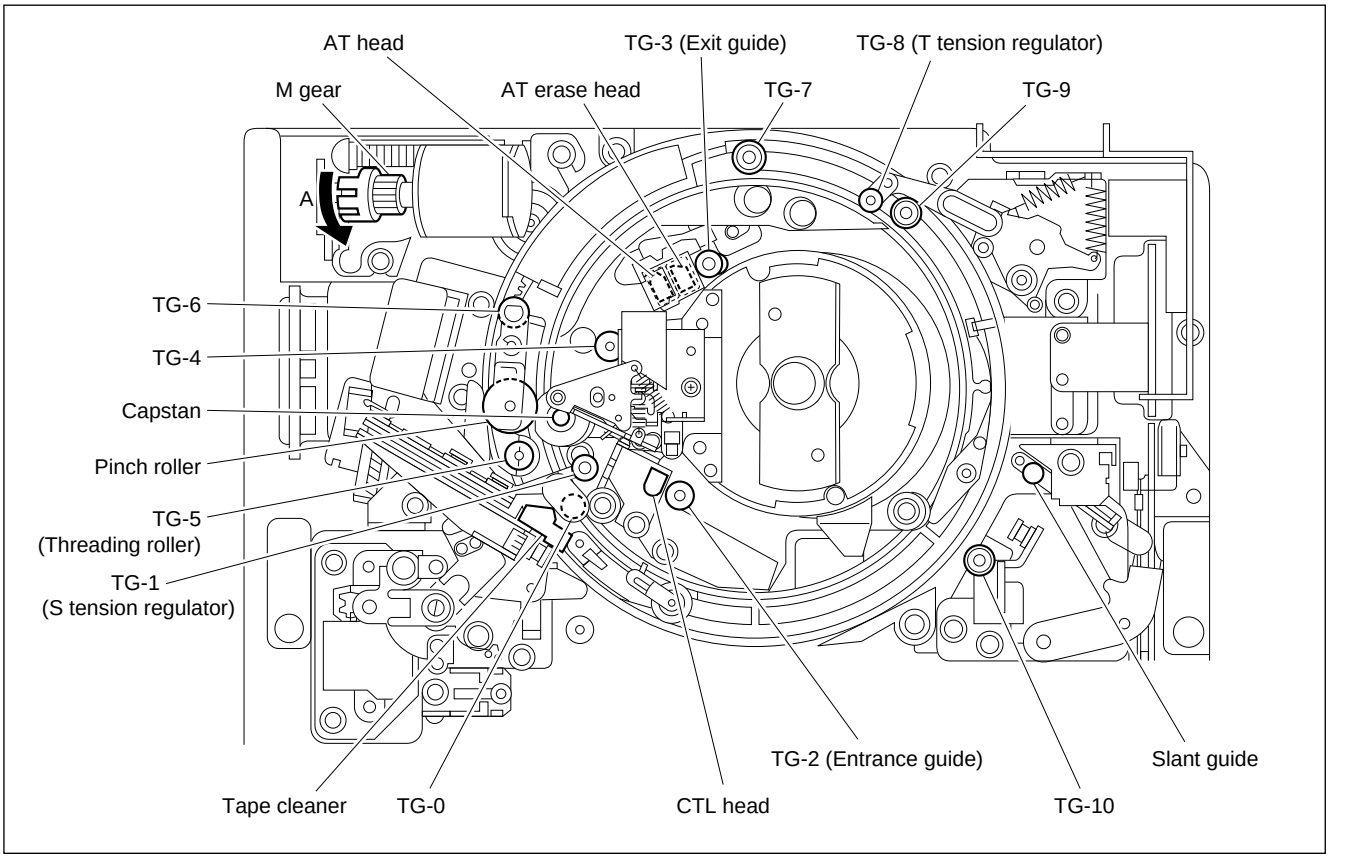
Threading end mode means that the threading ring rotates in the counterclockwise direction, then stops.

There are three ways of putting the unit into the threading end mode without installing the cassette compartment.

Method ①: Turn the power on.

Method ②: Press the STOP button under power-on state.

Method ③: Turn the M gear of the gear box assembly in the direction of the arrow A.



Threading End Mode

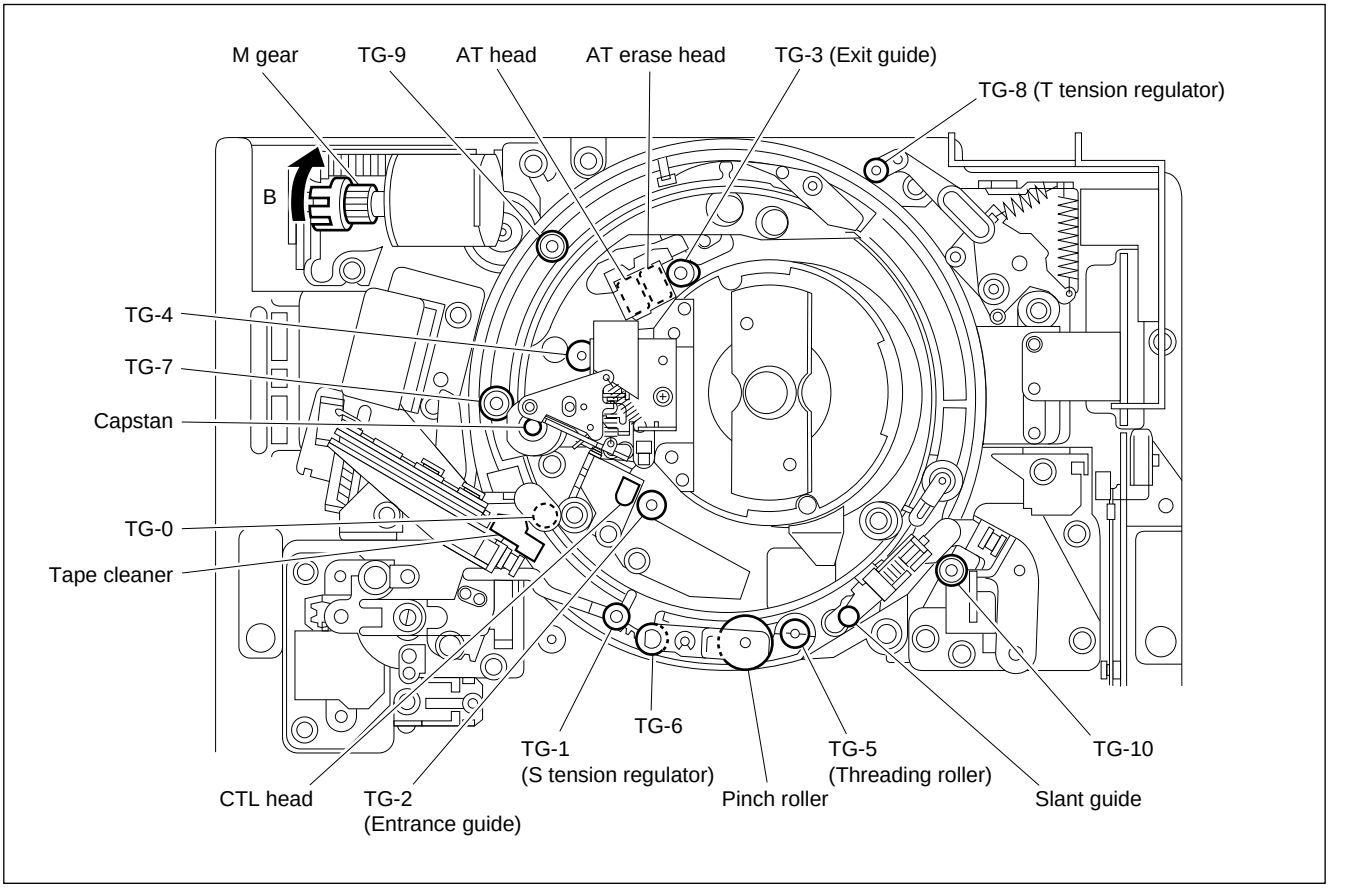
2. Unthreading End Mode

Unthreading end mode means that the threading ring rotates in the clockwise direction, then stops. (It is same state with EJECT completion mode.)

There are two ways of putting the unit into the unthreading end mode without installing the cassette compartment.

Method ①: Press the EJECT button under threading end mode.

Method ②: Turn the M gear of the gear box assembly in the direction of the arrow B.



Unthreading End Mode

3-1-3. L Cassette Position and S Cassette Position

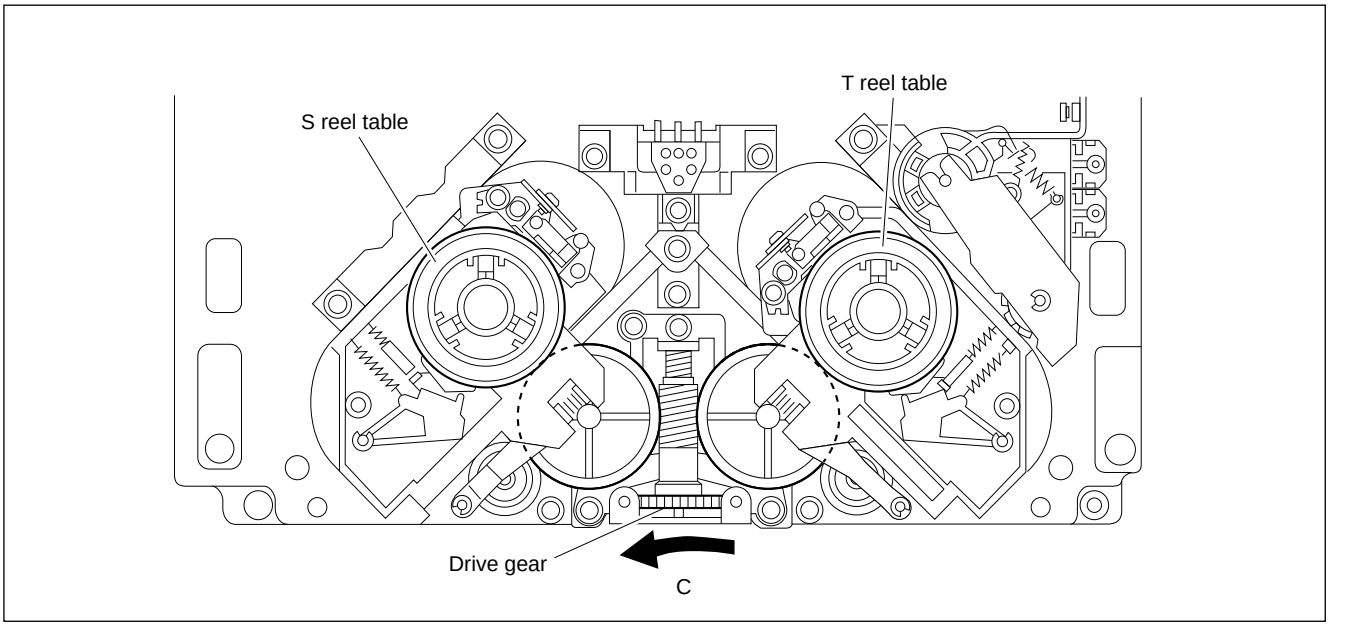
1. L Cassette Position

L cassette position means that the reel tables are in the position of L cassette tape.

There are two ways of putting the reel tables into the L cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow C.



L Cassette Position

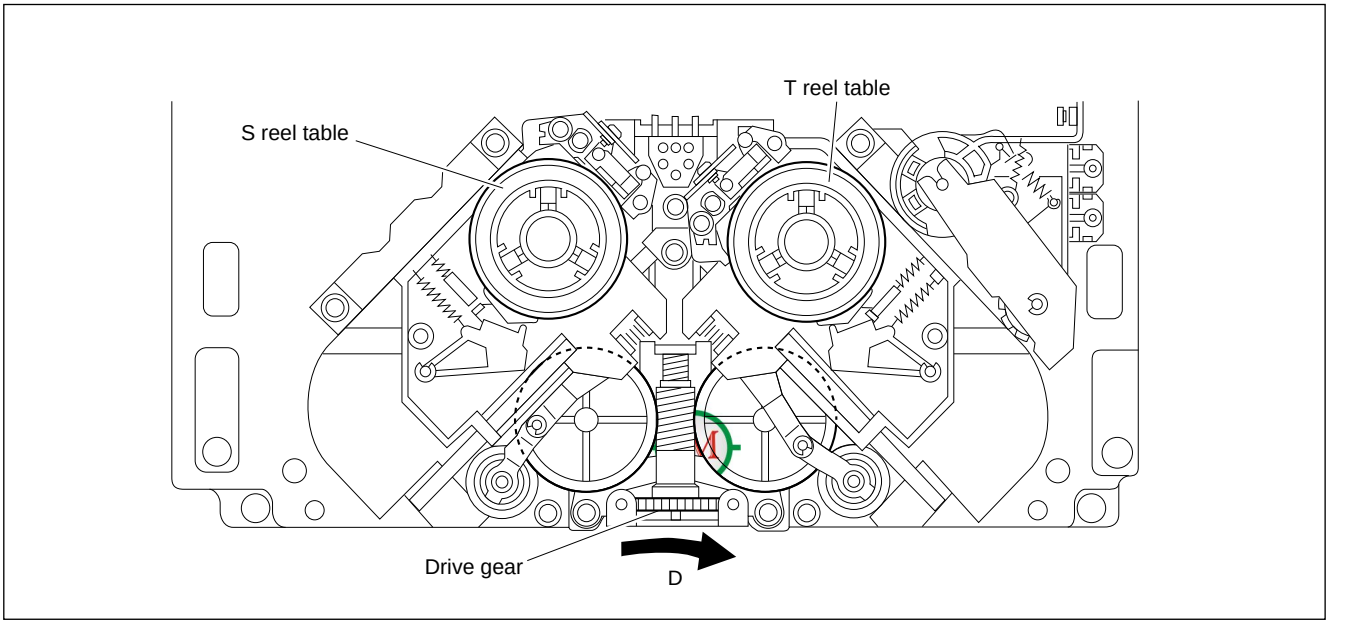
2. S Cassette Position

S cassette position means that the reel tables are in the position of S cassette tape.

There are two ways of putting the reel tables into the S cassette position without installing the cassette compartment.

Method ①: Press the switch S100 (D-1/side A) on the SS-83 board under power-on state.

Method ②: Turn the drive gear in the direction of the arrow D.



S Cassette Position

3-1-4. Basic Knowledge

1. Tape Cleaner

WARNING

Never touch the edge of the tape cleaner with bare hands.
It is in danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when replacing or adjusting the peripheral parts.

2. Tools

Clean the surface of the tool with a cleaning cloth moistened with cleaning fluid before use it.

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Be careful not to damage the tool. If the flawed tool is used, adjustment cannot be performed correctly.

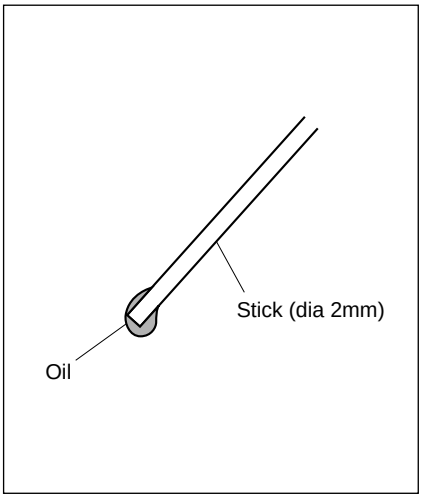
3. Note

(1) Grease and Oil

Please use only the specified grease and oil.
If the different grease or oil is used, major malfunctions may be caused due to differences in viscosity and ingredients.
And if the grease or oil that has been mixed with dust is used, major malfunctions may be caused.
Use the following grease and oil.

- Grease (SGL-505) : 7-661-000-10
- Oil : 7-661-018-18

Smear just enough grease to create a thin film on the surface of the part.
Any grease that adheres to other surrounding parts must be wipe with gauze or soft cloth.



Oil

A drop of oil is defined as follows:
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.

Do not use the grease and oil except for specified portions.

(2) Stop Washer and E Ring

It should not be used the stop washer and E ring once again.
It is recommended checking a required stop washer and E ring before replacement, and preparing more than required number.

3-2. Upper Drum Assembly Replacement

As for replacement time, refer to “Section 5. Periodic Maintenace and Inspection” of the maintenance manual part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Brush/Slip Ring Assembly
4. Release the Demagnetization Head Assembly
5. Remove the Height Determing Plate
6. Remove the Upper Drum Assembly
7. Cleaning (Upper Drum Assembly Mounting Surface, Lower Drum Flange Surface, Tape Running Surface, Lead Surface, and Contacting Points)
8. Install the Upper Drum Assembly
9. Cleaning (Height Determining Plate’s Lower Surface and Upper Surface of Drum Support)
10. Install the Height Determing Plate
11. Put the Demagnetization Head Assembly Back
12. Cleaning (DR-205 Board’s Contacting Points and Brush/Slip Ring Assembly Mounting Surface)
13. Install the Brush/Slip Ring Assembly
14. Connect the Flexible Board (CN2/SE-461 Board)
15. Cleaning (Rotary Heads and Upper Drum’s Tape Running Surface)
16. Install the Video Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running (Refer to Section 4-1-2.)
18. Confirm the Video Tracking (Refer to Section 4-1-3.)
19. Confirm the CTL Head Height (Refer to Section 4-1-4.)
20. Adjust the CTL Head Position (Refer to Section 4-1-5.)
21. Confirm the AT Head Height (Refer to Section 4-1-6.)
22. Confirm the AT Head Azimuth (Refer to Section 4-1-7.)
23. Confirm the AT Head Head-to Tape Contact (Refer to Section 4-1-8.)
24. Adjust the AT Head Position (Refer to Section 4-1-9.)
25. Perform the Electrical Adjustments after Drum Replacement (Refer to Section 5.)

Notes

- When the rotary head tip was worn or damaged, replace the whole upper drum assembly. It cannot be replaced only head tip.
- Never touch the rotating upper drum.

Basic Knowledge

Replace the upper drum assembly in the following case.

- A correct RF signal waveform cannot be obtained even if the tracking adjustment is performed.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

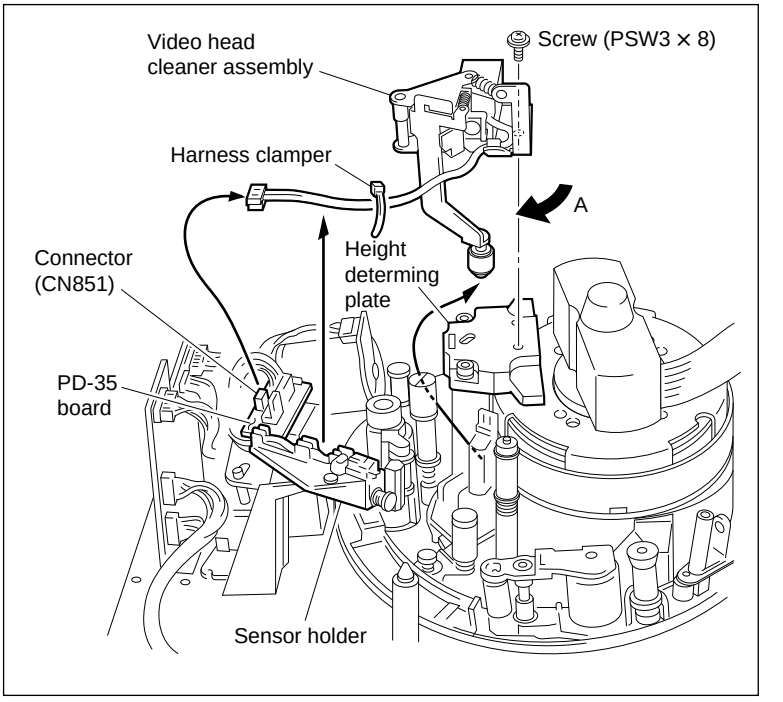
Tools

- Hexagonal wrench driver (2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252) : J-6252-520-A
- Torque screwdriver's bit (+2 mm, l=75 mm) : J-6323-420-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm) : J-6251-090-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Upper drum remover : Supplied with new repair upper drum

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

2. Disconnect the Flexible Board

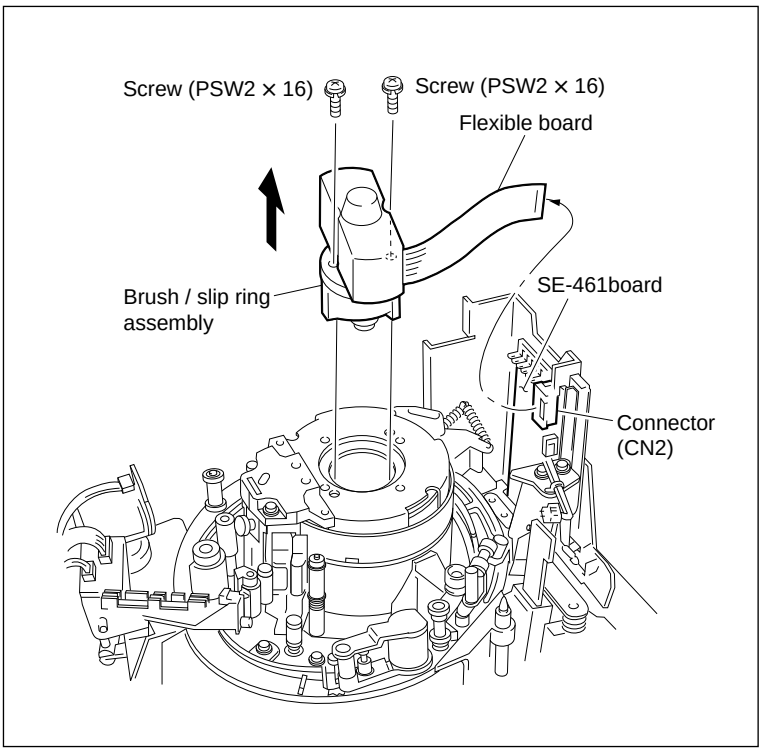
Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Brush/Slip Ring Assembly

Remove the two screws, then remove the brush/slip ring assembly.

CAUTION

- Do not apply excessive force to the brush/slip ring assembly at that time.
- If the screws remain into the screw holes of the brush/slip ring assembly, remove them once. When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.



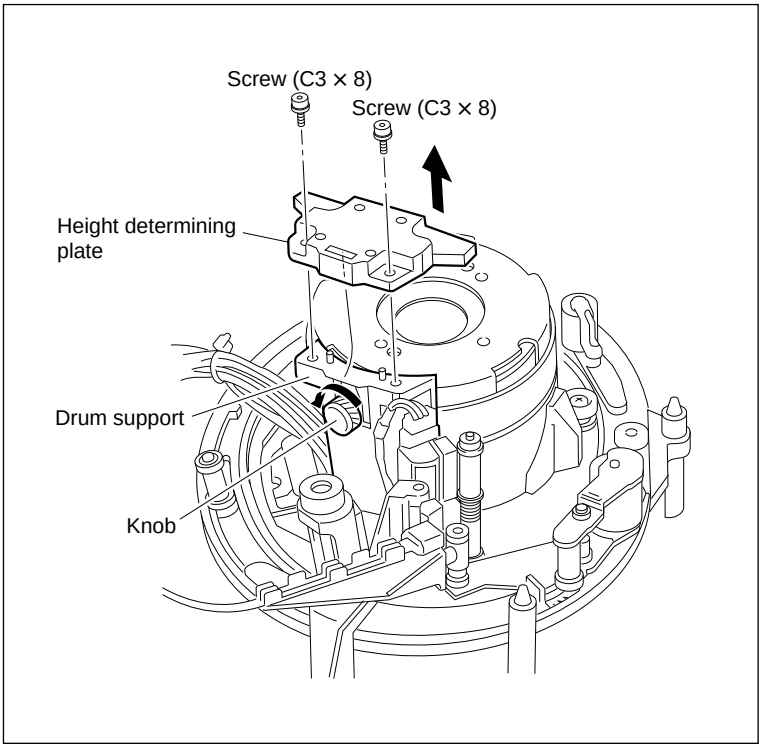
Remove the Brush/Slip Ring Assembly

4. Release the Demagnetization Head Assembly

Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.

5. Remove the Height Determining Plate

(1) Remove the two screws using a hexagonal wrench driver.
(2) Raise the height determining plate just above, then remove.



Remove the Height Determining Plate

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6. Remove the Upper Drum Assembly

(1) Insert the hexagonal wrench driver from the screw hole (A) and loosen the screw completely.

Note

The upper drum assembly is fixed with the four fixing screws (C3 × 12) in the screw holes (A). These screws cannot be removed because of stoppers.

(2) Check that the projection of the hexagon screw from remover's surfase is 5 mm or less.

Note

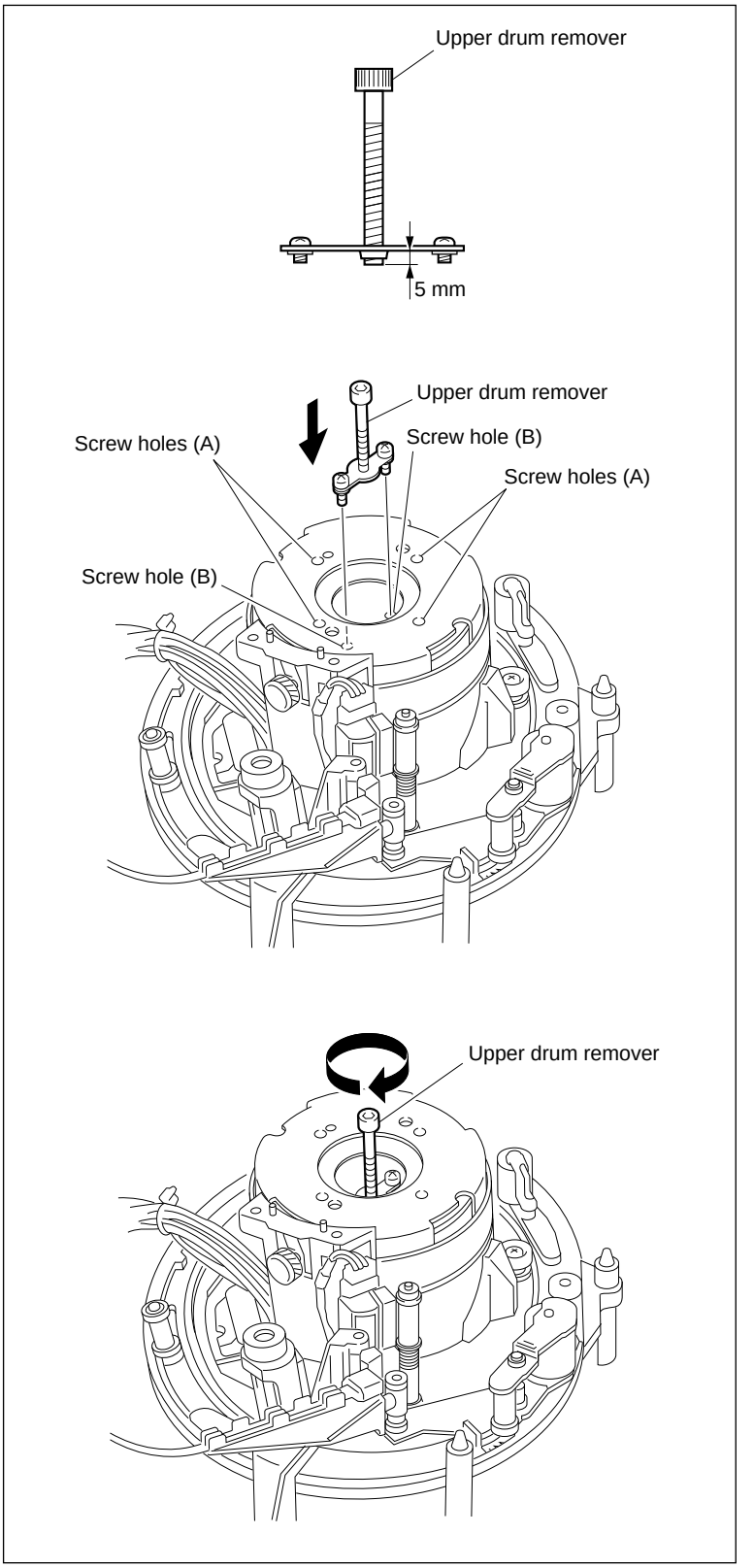
The upper drum remover is supplied with the new repair upper dum.

(3) Attach the upper drum remover to the two screw holes (B) of the brush-slipring assembly with two screws.

(4) Turn the hexagon screw of the upper drum remover clockwise by finger. The upper drum will be detached from the shaft of the lower drum slowly.

Note

If the four upper drum securing screws are not loosened completely and the hexagon screw of the upper drum remover is rotated, the lower drum may be damaged.



Remove the Upper Drum Assembly

Installation

Note

The upper drum cover is supplied with the upper drum as repair parts. And it is used for positioning of the upper drum. Never remove it in carelessly, and follow the instructions described below.

7. Cleaning

(1) Clean the portions below with a cleaning cloth moistened with cleaning fluid.
- New upper drum assembly mounting surfaces (shaded portions shown in the figure)
- Lower drum flanges (shaded portions shown in the figure) and edge portion
- Lower drum's tape running surface and lead portion (Refer to Section 5-2-4.)

Note

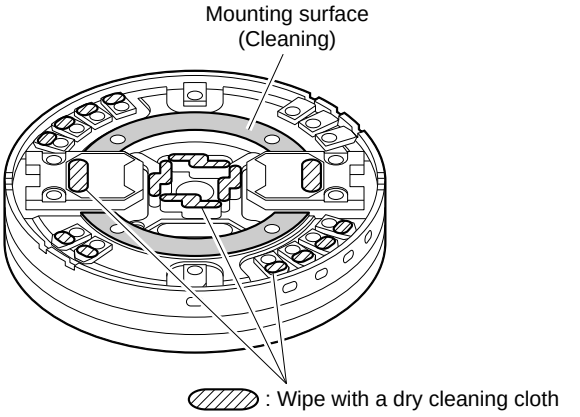
After cleaning, wipe with a dry cleaning cloth.

(2) Wipe the portions shown in figure with a dry cleaning cloth.

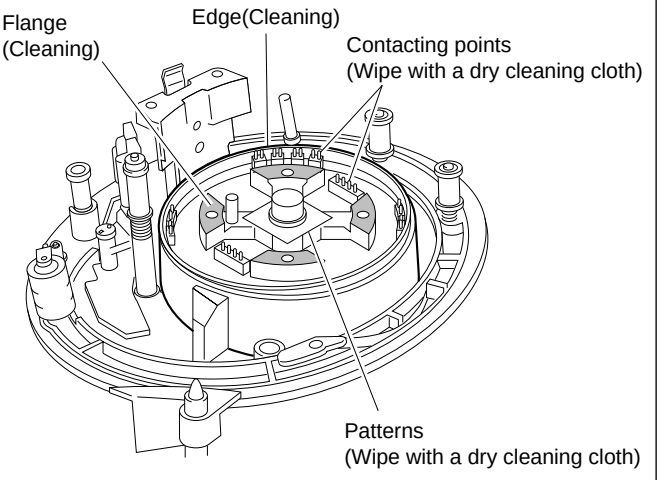
Note

Never apply cleaning fluid to the contacting points and patterns.
- 17 contacting points of upper drum
- 32 patterns of upper drum
- 24 contacting points of lower drum
- 32 patterns of lower drum

• Upper drum ASSY



• Lower drum



Cleaning

8. Install the Upper Drum Assembly

Note

When replacing the upper drum of this model, it is not necessary to do an eccentricity adjustment of the upper drum.

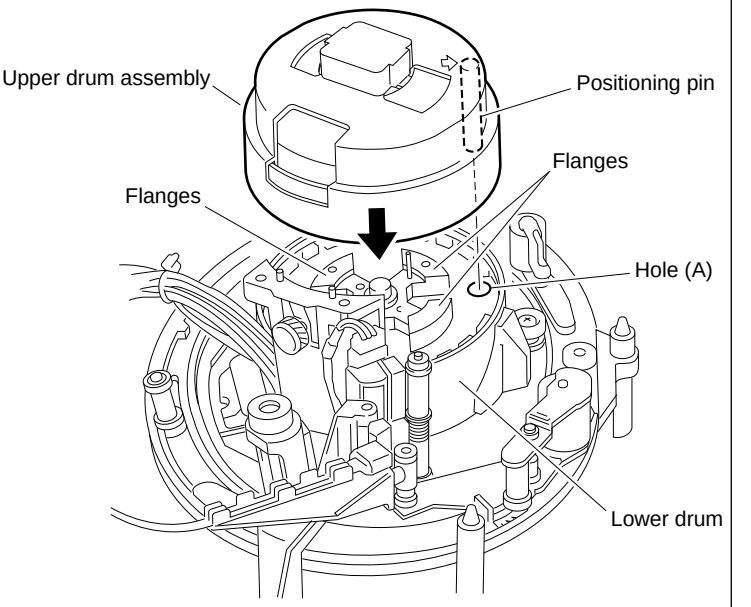
(1) Adjust the position of the hole (A) on DR-372 board with positioning pin on the upper drum cover. (Fig. 1)
(2) Put the upper drum assembly on the central shaft of the lower drum gently while keeping the state of (1).

Notes

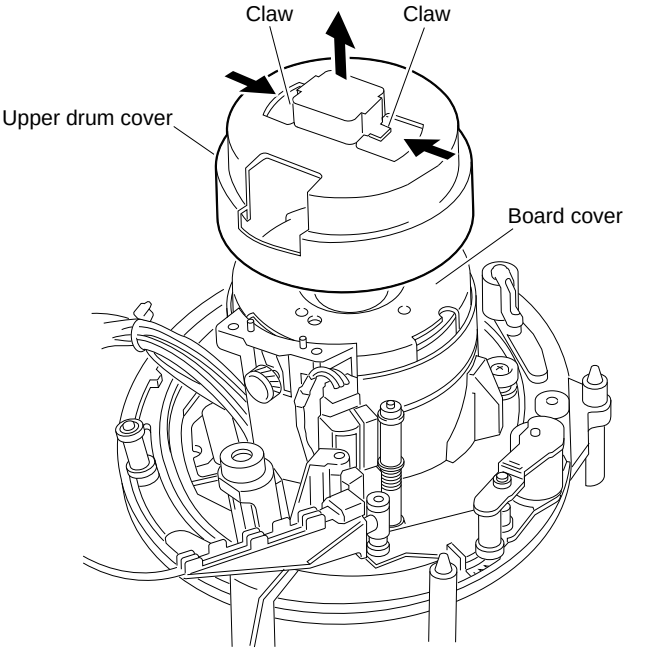
- Never hold the claws of the upper drum cover when installing the upper drum assembly.
- Be careful not to touch the AT head, peripheral tape guides and drum support when installing the upper drum assembly.
- Do not turn the upper drum with the upper drum cover is installed.

(3) Press the claws of the upper drum cover in the direction indicated by the arrows and raise the upper drum cover up, then remove it.
(4) Push the central portion of the upper drum down by finger, and place the upper drum on the flange of the lower drum surely.
(5) Set the torque screwdriver to 39.2×10^{-2} N•m(4.0 kgf • cm). Put the torque screwdriver in the four holes on the board cover of the upper drum assembly while keeping the state of (4). Tighten the four screws in the sequence shown on the board cover gradually.
(6) Set the torque screwdriver to 58.8×10^{-2} N•m(6.0 kgf • cm).
Tighten the four screws in the same sequence as in step (5) using a torque screwdriver.

<Fig.1>



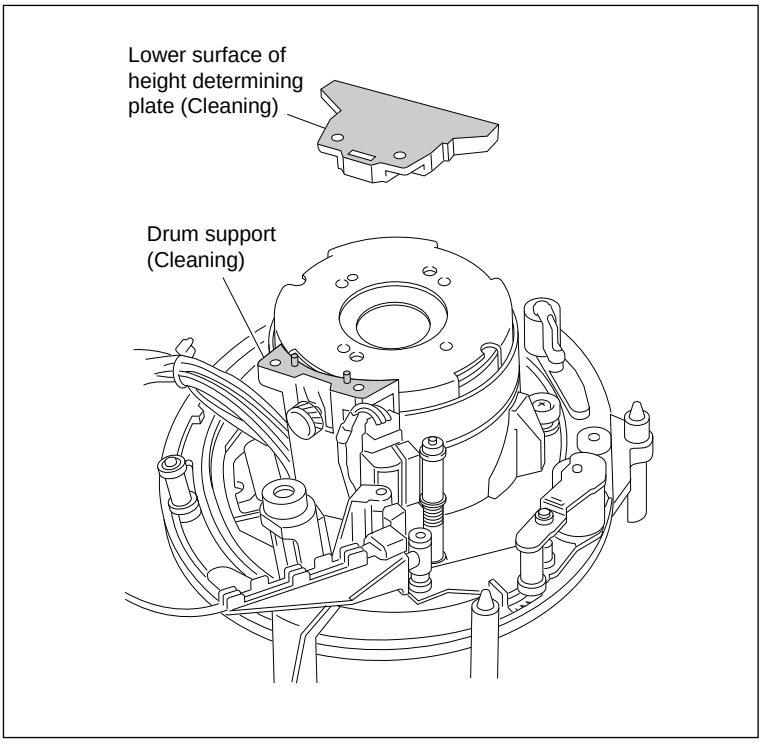
• Remove the upper drum cover



Install the upper Drum Assembly

9. Cleaning

Clean the lower surface (shaded portion in the figure) of the height determining plate and the upper surface of the drum support (shaded portion in the figure) with a soft cloth.



Cleaning

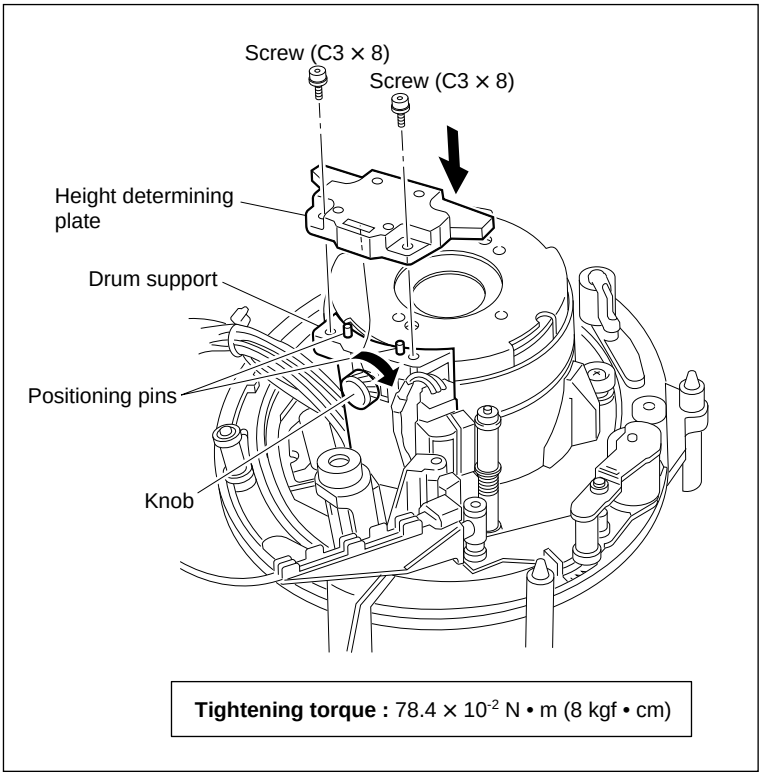
10. Install the Height Determining Plate

(1) Install the height determining plate so that the positioning pins of the drum support are put into the holes of the height determining plate.
(2) Tighten the two screws alternately and gradually.

Tightening torque: 78.4×10^{-2} N•m
(8 kgf • cm)

11. Put the Demagnetization Head Assembly Back

Turn the knob of the demagnetization head assembly clockwise until it will be stopped.



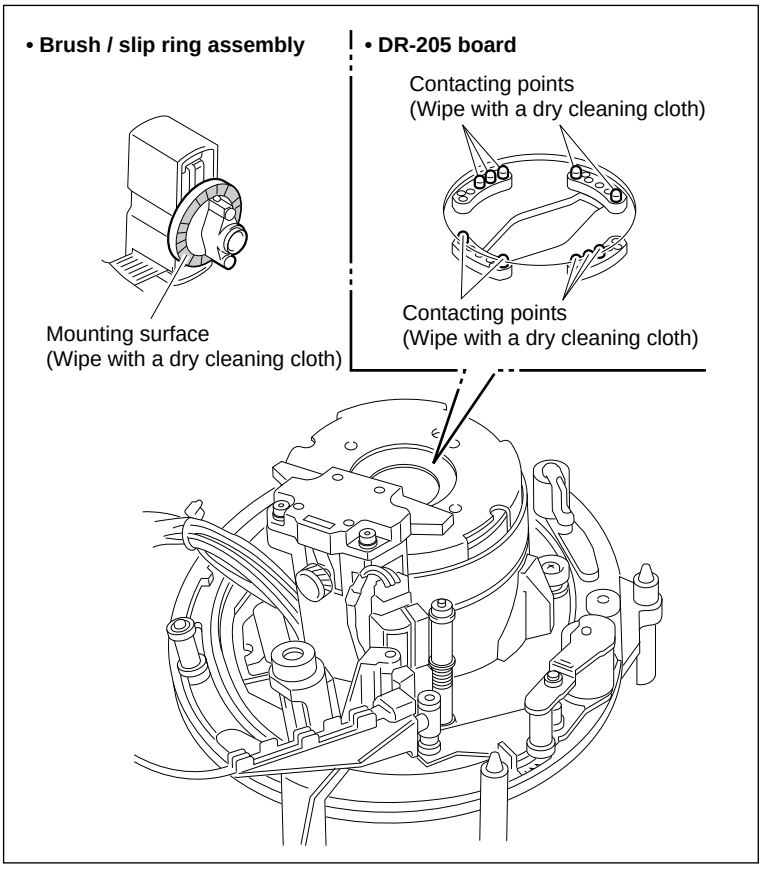
Install the Height Determining Plate/
Put the Demagnetization Head Assembly Back

12. Cleaning

Wipe the brush/slip ring assembly mounting surface (shaded portion in the figure) and contacting points on the DR-205 board with a dry cleaning cloth.

CAUTION

- Do not apply cleaning fluid to the contacting points.
- If the screws remain into the screw holes of the brush/slip ring assembly, remove them once. When the brush/slip ring assembly is turned upside down, these screws may be dropped into the slip ring cover.


• Brush / slip ring assembly
• DR-205 board
Contacting points
(Wipe with a dry cleaning cloth)
Mounting surface
(Wipe with a dry cleaning cloth)
Contacting points
(Wipe with a dry cleaning cloth)

Cleaning

13. Install the Brush/Slip Ring Assembly

(1) Install the brush/slip ring assembly in the direction shown in the figure.

(2) Tighten the two screws alternately and gradually while pushing both sides of the flange equally from above.

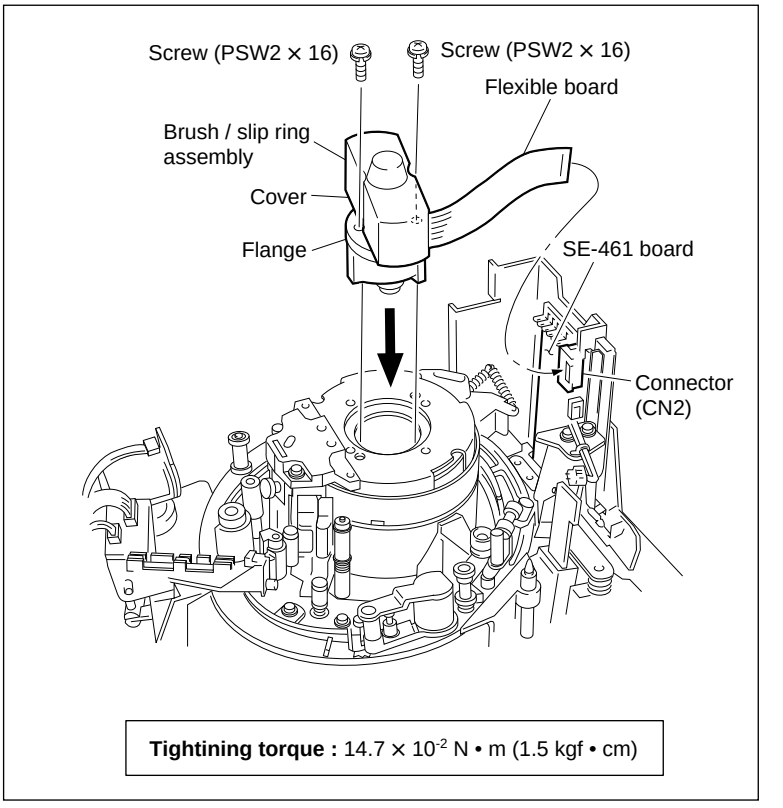
Tightening torque: 14.7×10^{-2} N•m
(1.5 kgf • cm)

CAUTION

Never apply excessive force to the cover.

14. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461board.



Install the Brush/Slip Ring Assembly

15. Cleaning

Clean the portions below.

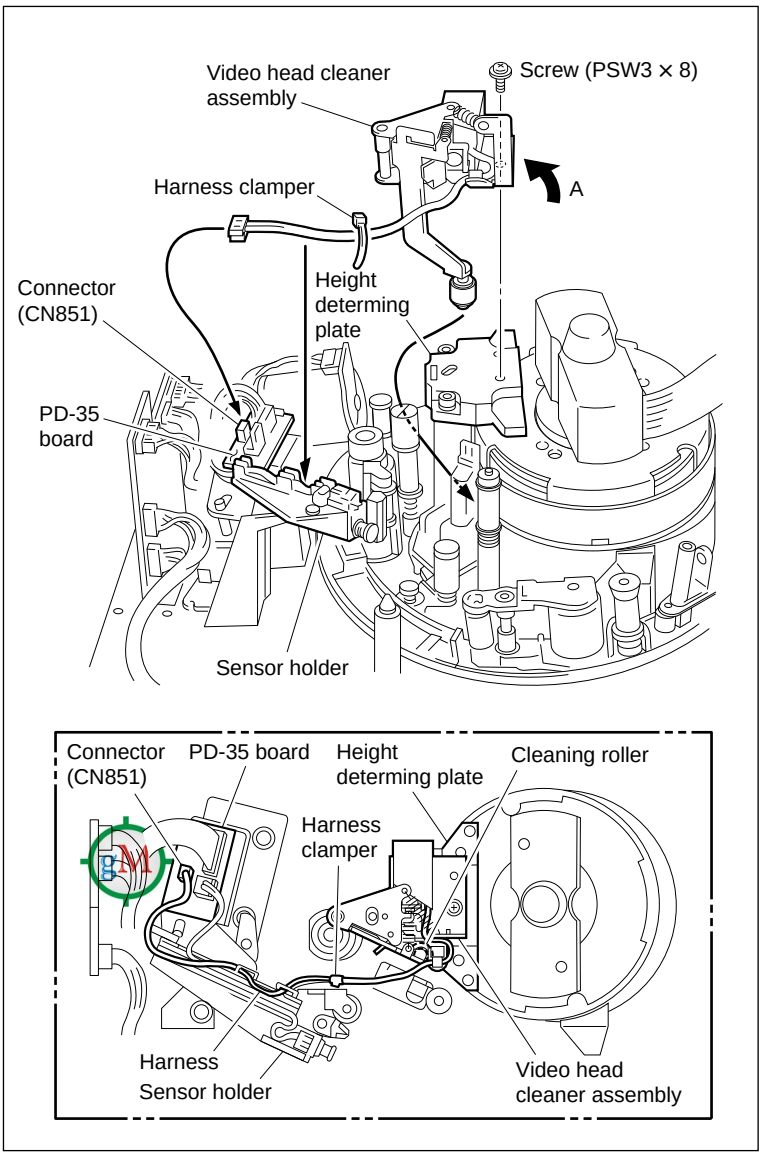
- Video heads and tape running surface of the upper drum. (Refer to Section 5-2-3 of the maintenance manual part1.)

Note

After cleaning, wipe with a dry cleaning cloth.

16. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and CTL head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the CTL head harness and the video head cleaner harness with the harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to Section 3-5, step5.)



Install the Video Head Cleaner Assembly

Adjustment after Replacement

17. Confirm the Tape Running

Refer to Section 4-1-2.

18. Confirm the Video Tracking

Refer to Section 4-1-3.

19. Confirm the CTL Head Height

Refer to Section 4-1-4.

20. Adjust the CTL Head Position

Refer to Section 4-1-5.

21. Confirm the AT Head Height

Refer to Section 4-1-6.

22. Confirm the AT Head Azimuth

Refer to Section 4-1-7.

23. Confirm the AT Head Head-to-Tape Contact

Refer to Section 4-1-8.

24. Adjust the AT Head Position

Refer to Section 4-1-9.

25. Perform the Electrical Adjustments after Drum Replacement

Refer to Section 5.

3-3. Drum Assembly Replacement

As for replacement time, refer to “Section 5. Periodic Maintennace and Inspection” of the maintenance manual part 1.

Outline

Replacement

1. Remove the Video Head Cleaner Assembly
2. Disconnect the Flexible Board (CN2/SE-461 Board)
3. Remove the Drum Assembly
4. Cleaning (Drum Assembly Mounting Surfaces and Chassis Mounting Surfaces)
5. Install the Drum Assembly
6. Connect the Flexible Board (CN2/SE-461 Board)
7. Cleaning (Rotary Heads, Upper Drum’s Tape Running Surface, and Lower Drum’s Tape Running Surface)
8. Install the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.) (C015: DRUM MOTOR)
10. Confirm the Tape Running (Refer to Section 4-1-2.)
11. Adjust the Video Tracking (Refer to Section 4-1-3.)
12. Adjust the CTL Head Height (Refer to Section 4-1-4.)
13. Adjust the CTL Head Position (Refer to Section 4-1-5.)
14. Adjust the AT Head Height (Refer to Section 4-1-6.)
15. Adjust the AT Head Azimuth (Refer to Section 4-1-7.)
16. Confirm the AT Head Head-to-Tape Contact (Refer to Section 4-1-8.)
17. Adjust the AT Head Position (Refer to Section 4-1-9.)
18. Confirm the Audio Level in REV Mode (Refer to Section 4-1-10.)
19. Confirm the Tape Running (Refer to Section 4-1-2.)
20. Perform the Electrical Adjustment after Drum Replacement (Refer to Section 5.)

Note

Be careful not to damage the AT head and peripheral tape guides when removing or installing the drum assembly.

Basic knowledge

Replace the drum assembly in the following cases.

- The upper or lower drum’s tape running surface is damaged and cannot be repaired.
- A correct RF signal waveform cannot be obtained due to the worn upper or lower drum even if the tracking adjustment is performed.
- The VTR performance deteriorates because of the noise or jitter caused by the bearing life.

Preparation

1. Turn the power off.
2. Remove the Upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part1.)

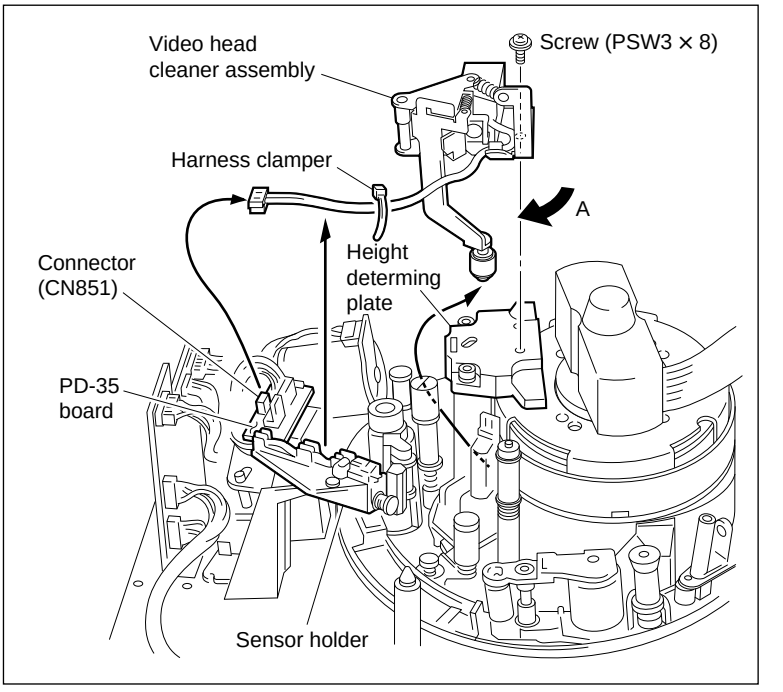
Tools

- Hexagonal wrench driver (2.5 mm) : 7-700-766-04
- Torque screwdriver (6 kg•cm)(JB-5251) : J-6252-510-A
- Torque screwdriver (12 kg•cm)(JB-5252) : J-6252-520-A
- Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm) : J-6251-090-A
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.



Remove the Video Head Cleaner Assembly

2. Disconnect the Flexible Board

Disconnect the flexible board from connector CN2 on the SE-461 board.

3. Remove the Drum Assembly

(1) Disconnect the connector on the harness rail.

(2) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the lower drum fixing screw.

Note

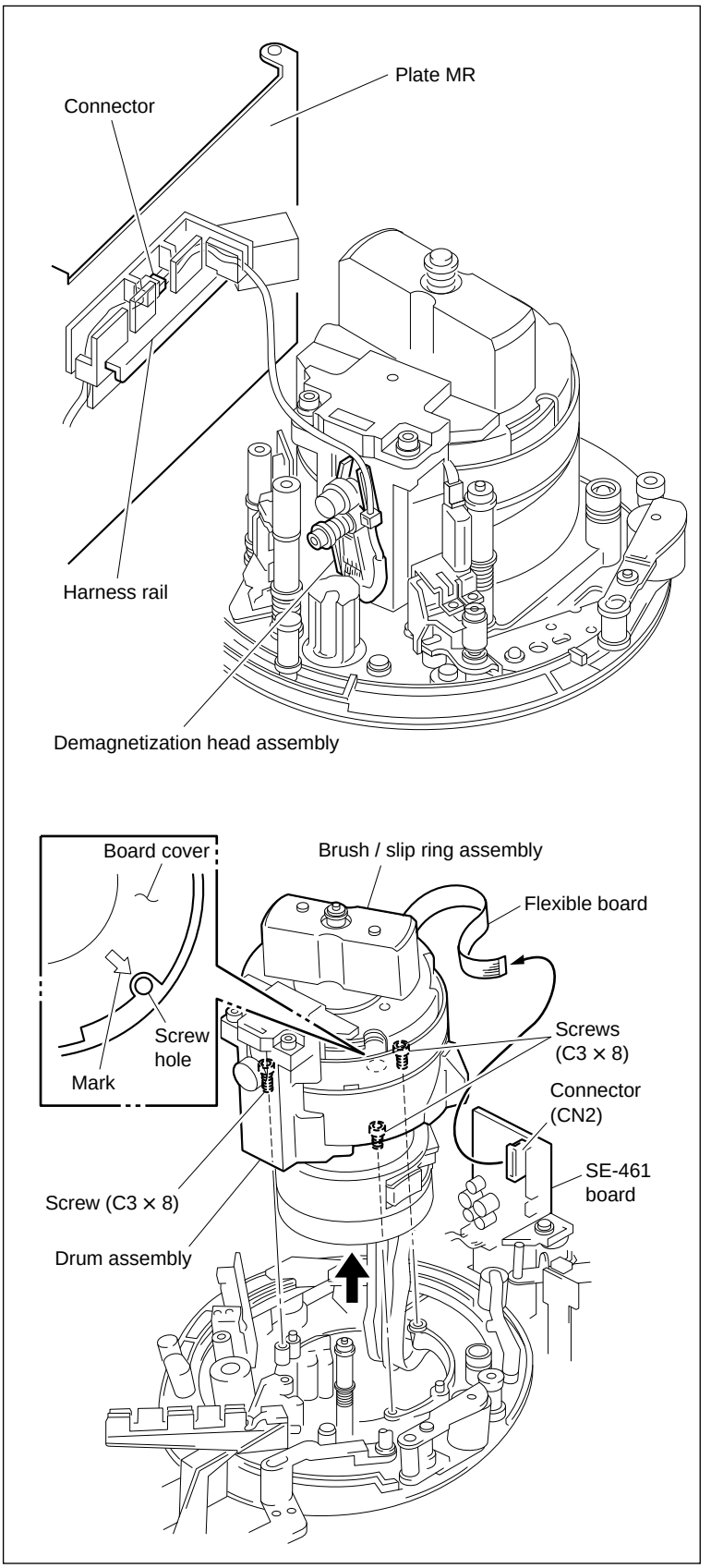
The drum assembly is fixed to the chassis with the three fixing screws (C3 × 8) in the screw hole.

(3) Loosen the screw fully using a hexagonal wrench driver.

Note

These screws cannot be removed because of stoppers.

(4) Rotate the upper drum counterclockwise by finger and loosen other two screws fully in the same way as in steps (2) and (3).



(5) Raise the drum assembly just above and remove the harness from the harness holders at the bottom.

Note

Be careful not to raise the drum assembly by holding the brush/slip ring assembly.

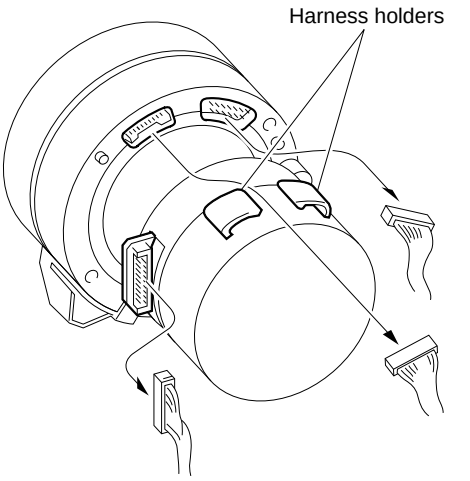
(6) Disconnect three connectors in the state of step (5). The drum assembly can then be removed.

Note

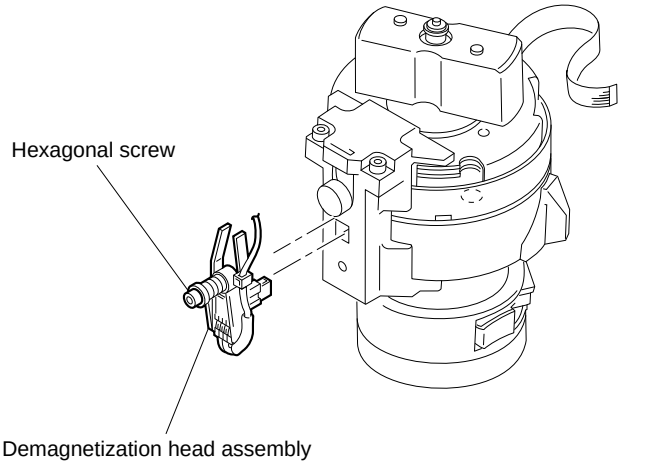
Be careful not to touch the AT head and peripheral tape guides when removing the drum assembly.

(7) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.

• Disconnect the connectors



• Remove the demagnetization head assembly



Remove the Drum Assembly

http://getMANUAL.com

Installation

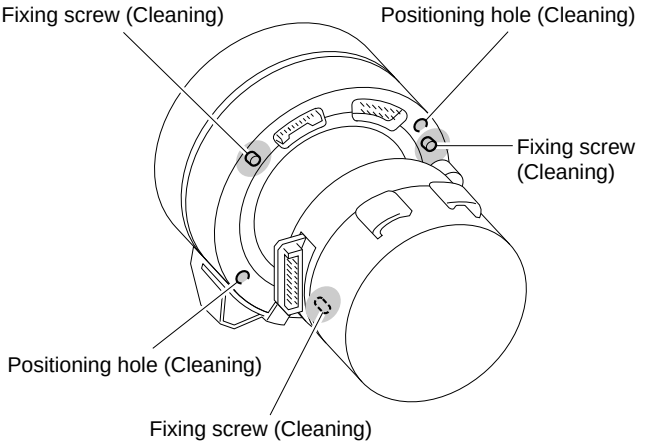
4. Cleaning

Clean a new drum assembly mounting surfaces and chassis mounting surfaces with a cleaning cloth moistened with cleaning fluid.

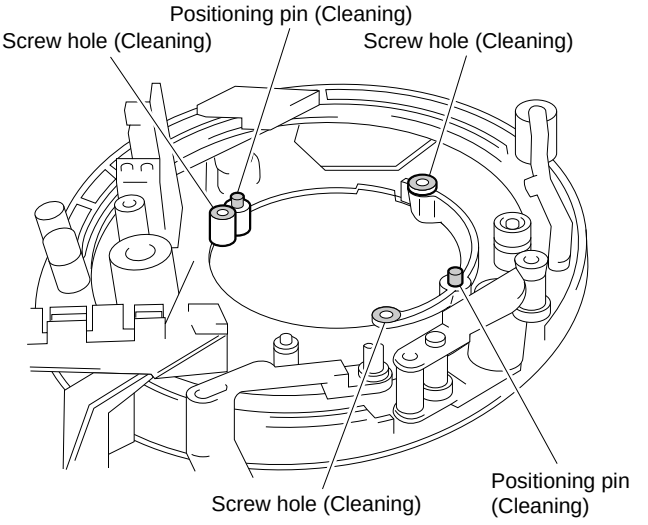
Note

After cleaning, wipe with a dry cleaning cloth.

• Drum assembly



• Chassis



Cleaning

5. Install the Drum Assembly

(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

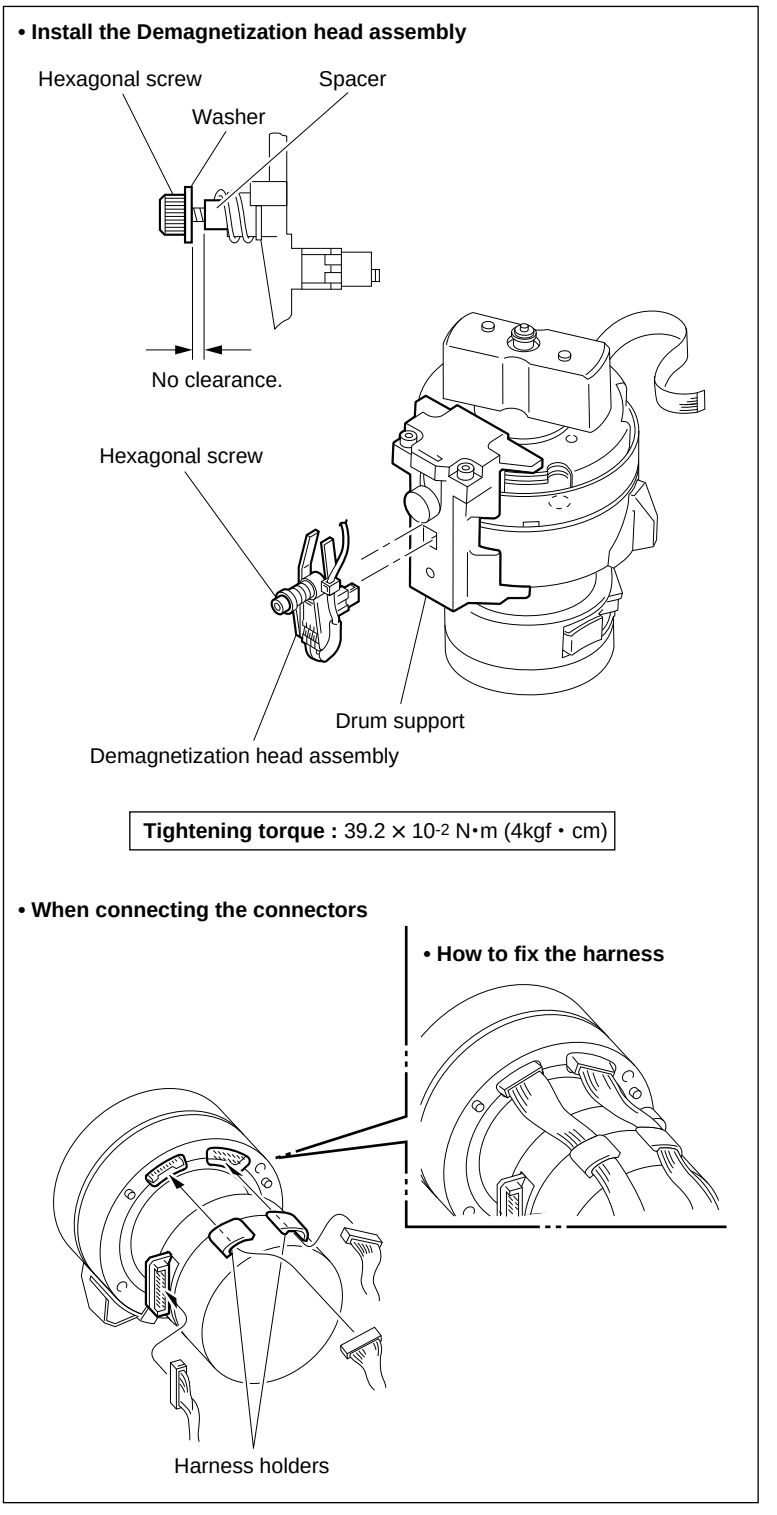
Tightening torque: 39.2×10^{-2} N•m
(4 kgf • cm)

(2) Hold the drum support and connect the three connectors disconnected in (6) of step 3.

CAUTION

- Hold the height determining plate and the drum support at that time. Be careful not to hold the upper drum and the brush/slip ring assembly.
- Pay attention to the direction of the connectors.

(3) Fix the harness by harness holders as shown in the figure.



Install the Drum Assembly

(4) Adjust the two positioning holes of the drum assembly with the two positioning pins of the chassis, and install it to the chassis while passing the harness under the chassis.

CAUTION

1. Be careful not to touch the AT head and tape guide at that time.
2. Be careful not to put the harness between the lower drum and the chassis.

(5) Confirm that the drum assembly is firmly inserted into the positioning pins.
(6) Rotate the upper drum assembly manually counterclockwise and align the position of the mark "⇨" indicated on the board cover with the fixing screw.
(7) Tighten the screw tentatively.
(8) Tighten other two screws tentatively in the same way as in steps (6) and (7).
(9) Gradually tighten the three screws in the order of counterclockwise.

Tightening torque: 78.4×10^{-2} N•m
(8 kgf • cm)

(10) Connect the connector of the demagnetization head assembly to the connector on the harness rail.

6. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-461 board, then lock.

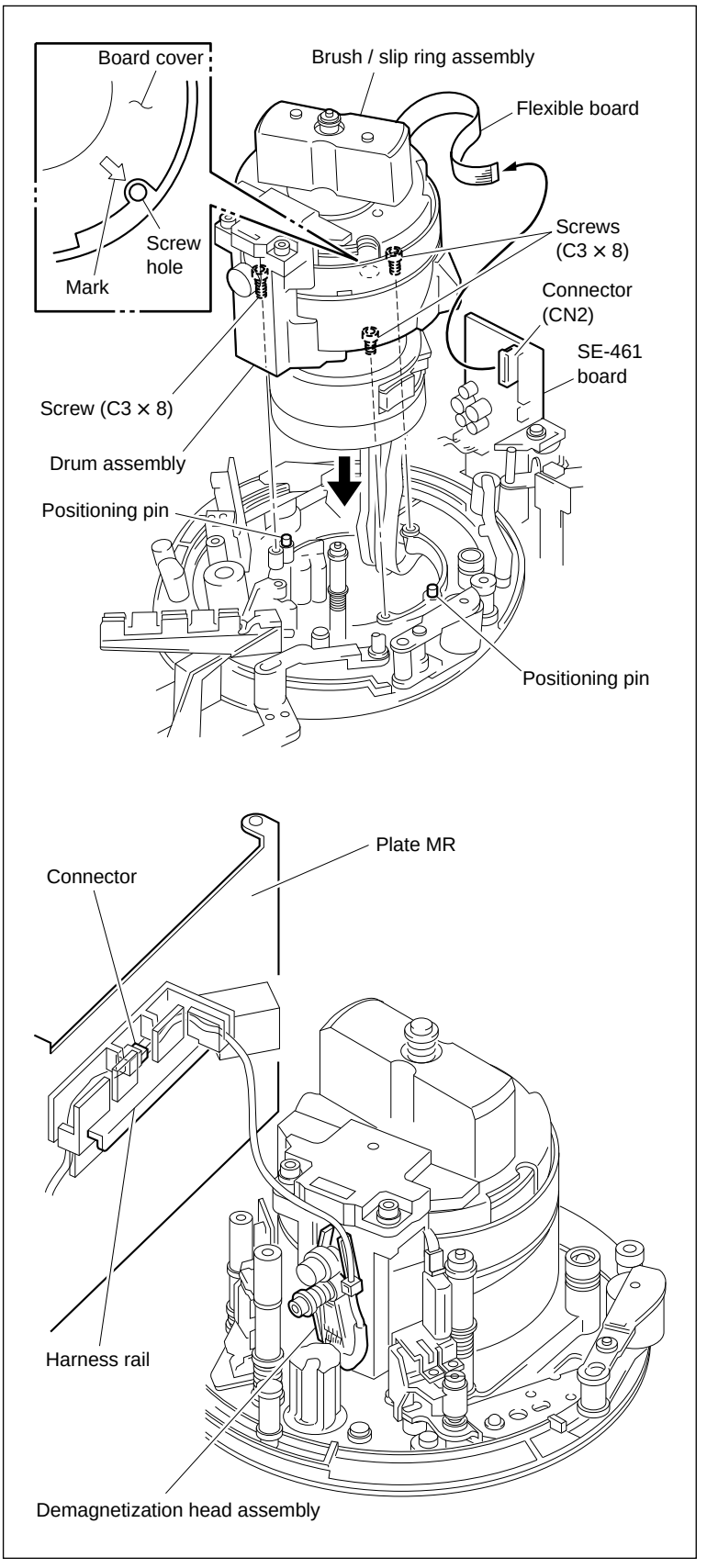
7. Cleaning

Clean the portions below.

(1) Video head and tape running surface of the upper drum. (Refer to Section 5-2-3 of the maintenance manual part 1.)
(2) Lower drum's tape running surface and lead portion. (Refer to Section 5-2-4 of the maintenance manual part 1.)

CAUTION

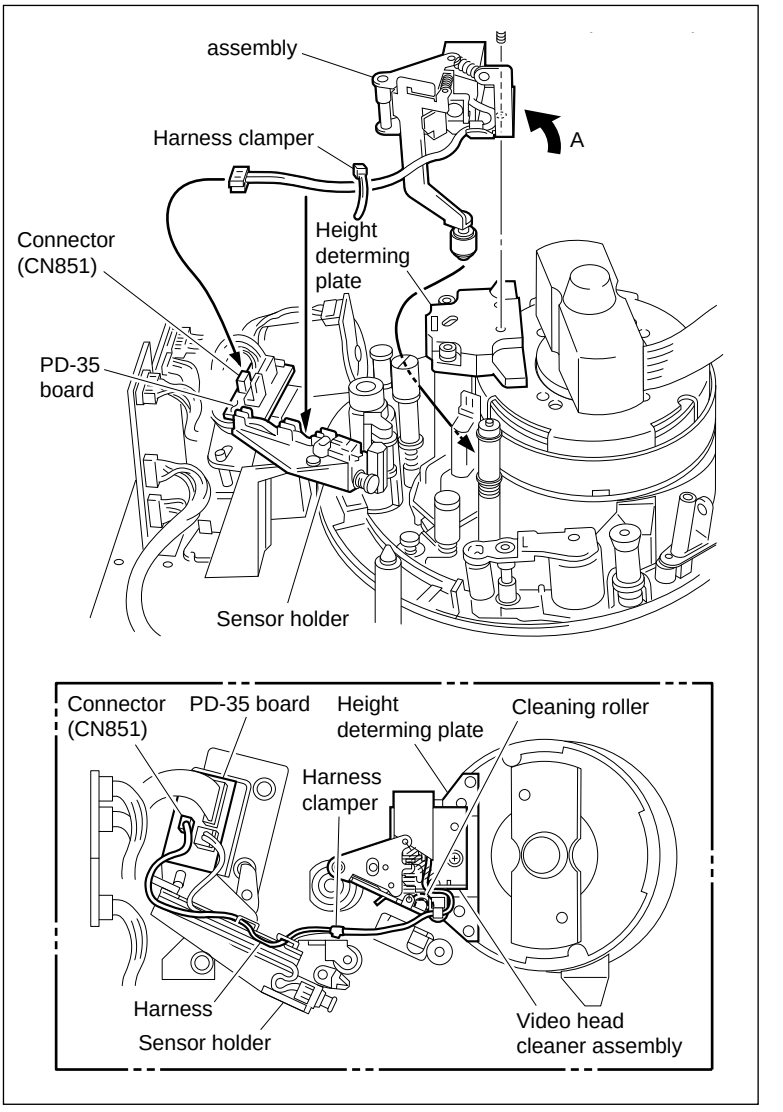
After cleaning, wipe with a dry cleaning cloth.



Install the Drum Assembly

8. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller into the clearance between the height determing plate and CTL head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the CTL head harness and the video head cleaner harness with the harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to section 3-5, step5)



Install the Video Head Cleaner Assembly

Adjustment after Replacement

9. Confirm the Drum Motor Operation
Refer to Section 4-2 of the maintenance manual part 1. (C015: DRUM MOTOR)

10. Confirm the Tape Running
Refer to Section 4-1-2.

11. Adjust the Video Tracking
Refer to Section 4-1-3.

12. Adjust the CTL Head Height
Refer to Section 4-1-4.

13. Adjust the CTL Head Position
Refer to Section 4-1-5.

14. Adjust the AT Head Height
Refer to Section 4-1-6.

15. Adjust the AT Head Azimuth
Refer to Section 4-1-7.

16. Confirm the AT Head Head-to-Tape Contact
Refer to Section 4-1-8.

17. Adjust the AT Head Position
Refer to Section 4-1-9.

18. Confirm the Audio Level in REV Mode
Refer to Section 4-1-10.

19. Confirm the Tape Running
Refer to Section 4-1-2.

20. Perform the Electrical Adjustment after Drum Replacement
Refer to Section 5.

3-4. Brush Slip Ring Assembly Replacement

Replace the brush slip ring assembly every 6,000 hours of the drum rotation.

Outline

Replacement

1. Disconnect the Flexible Board (CN2/SE-461 Board)
2. Remove the brush Slip Ring Assembly
3. Cleaning (Contact Portion of the DR-205 Board and Installation Surface of Brush Slip Ring Assembly)
4. Install the Brush Slip Ring Assembly
5. Connect the Flexible Board (CN2/SE-461 Board)

Adjustment after Replacement

6. DT Check (Refer to Section 4-2-3 of the maintenance manual part 1.) (C060: SG LOOP CHECK)
7. RF Check (Refer to Section 4-2-4 of the maintenance manual part 1.) (C1: RF CHECK)

Note

Replace the brush slip ring assembly when the brush or slip ring is worn or damaged. The brush slip ring assembly cannot be replaced by only the brush or slip ring.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm): J-6323-420-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Disconnect the Flexible Board

Disconnect the flexible board from the connector CN2 on the SE-461 board.

2. Remove the Brush Slip Ring Assembly

(1) Remove the two screws, then remove the brush slip ring assembly.

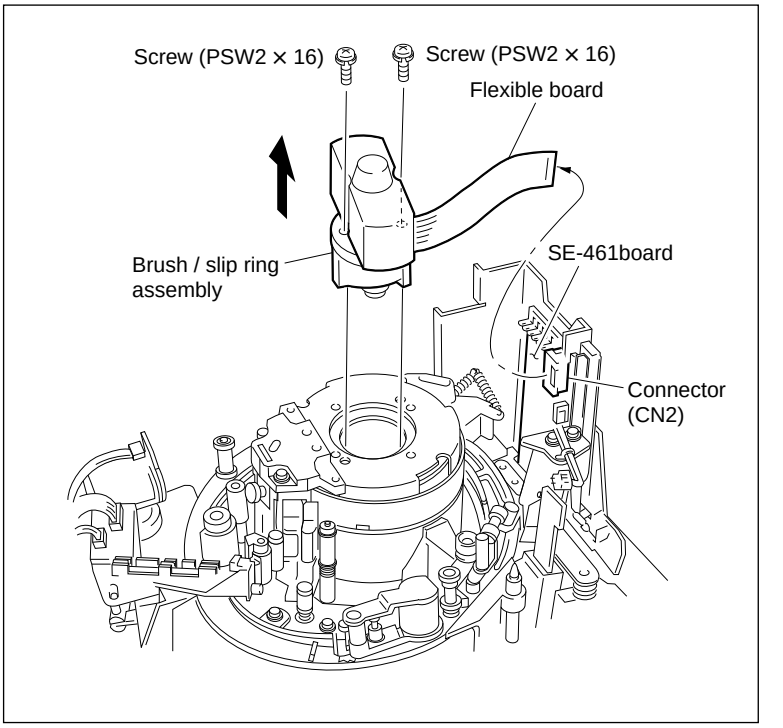
Note

Do not apply any force forcibly to the brush slip ring assembly at that time.

(2) Turn the brush slip ring assembly upside down and take out the screws.

Note

Be careful not to drop the screws in the cover at that time.



Remove the Brush Slip Ring Assembly

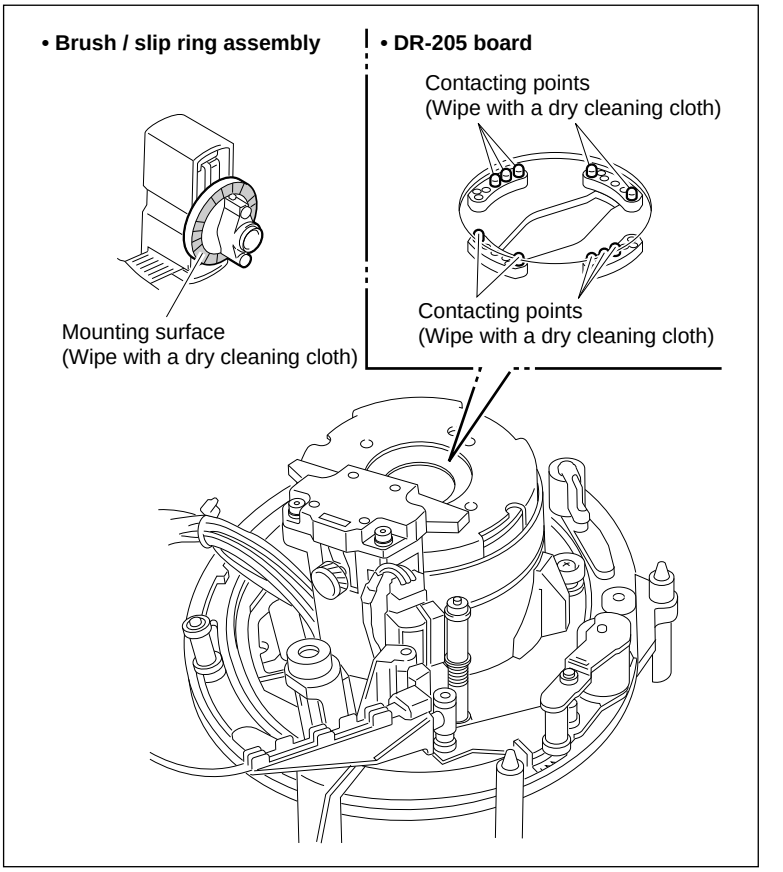
Installation

3. Cleaning

Wipe the mounting surface (the portion in the figure) of the brush slip ring assembly and the contacting points of the DR-205 board with a dry cleaning cloth.

Note

Never apply cleaning fluid to the contact portions.


• Brush / slip ring assembly
• DR-205 board
Contacting points (Wipe with a dry cleaning cloth)
Mounting surface (Wipe with a dry cleaning cloth)
Contacting points (Wipe with a dry cleaning cloth)

Cleaning

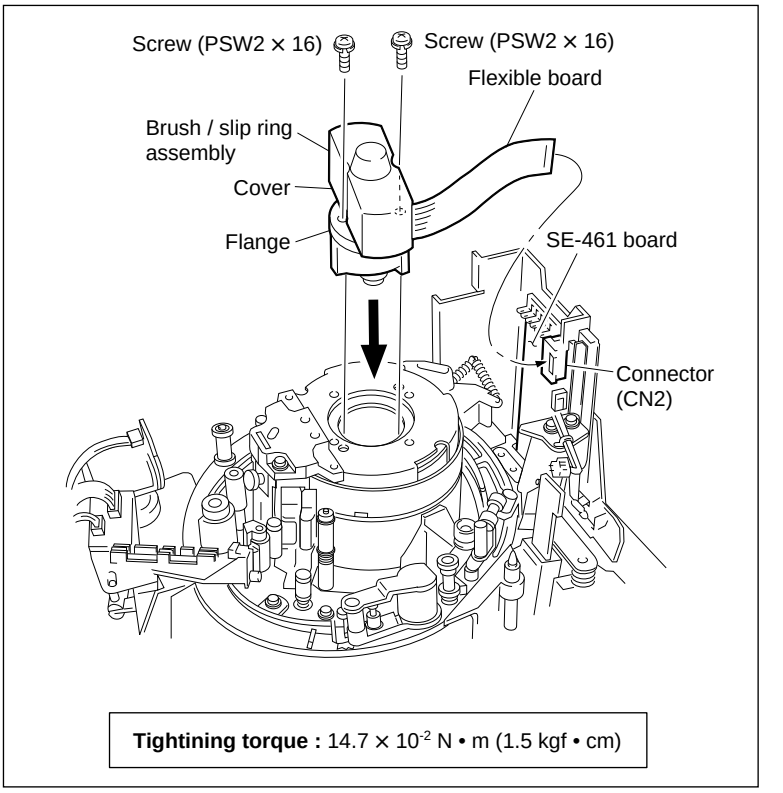
4. Install the Brush Slip Ring Assembly

(1) Insert the two screws taken out in (2) of step 2 into the screw holes of the brush slip ring assembly.
(2) Install the brush slip ring assembly in the direction shown in the figure.
(3) Tighten the two screws alternately and gradually while pushing both sides of the flange uniformly.

Tightening torque: 14.7×10^{-2} N • m
(1.5 kgf • cm)

5. Connect the Flexible Board

Connect the flexible board to the connector CN2 on the SE-461 board, then lock.



Install the Brush Slip Ring Assembly

Adjustment after Replacement

6. DT Check

Refer to Section 4-2-3 of the maintenance manual part 1. (C060: SG LOOP CHECK)

7. RF Check

Refer to Section 4-2-4 of the maintenance manual part 1. (C1: RF CHECK)

3-5. Cleaning Roller and Video Head Cleaner Assembly Replacement

Replace the cleaning roller every 6,000 hours of the drum rotating.
Replace the video head cleaner assembly ealier time either 6,000 hours of the drum rotating or 200,000 times of the threading.
The cleaning roller is included in the video head cleaner assembly.

Outline

Replacement

1. Remove the Harness (CN851/PD-35 Board)
2. Remove the Video Head Cleaner Assembly
3. Replace the Cleaning Roller
4. Install the Video Head Cleaner Assembly
5. Adjust the Cleaning Roller Position
6. Install the Harness (CN851/PD-35 Board)

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation (Refer to Section 4-2 of the maintenance manual part 1.)
   (C023: CLEANING ROLLER)

Note

When the cleaning roller is replaced, it is recommended to replace the CR spacer at the same time.
CR spacer : 3-182-765-02

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part1.)

Removal

1. Remove the Harness

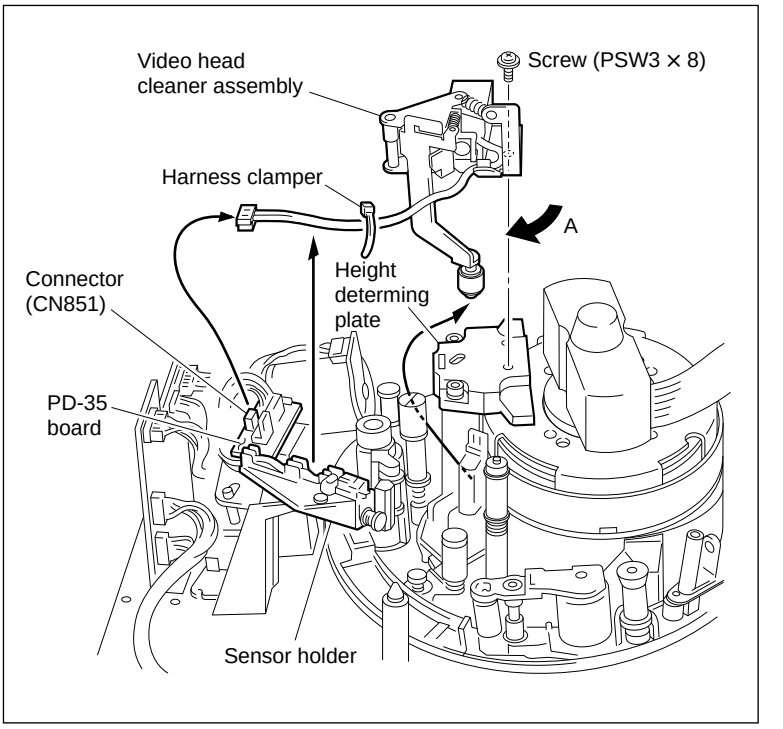
(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.

2. Remove the Video Head Cleaner Assembly

Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

Perform step 5 and later when replacing the video head cleaner assembly.
Perform step 3 and later when replacing the cleaning roller.



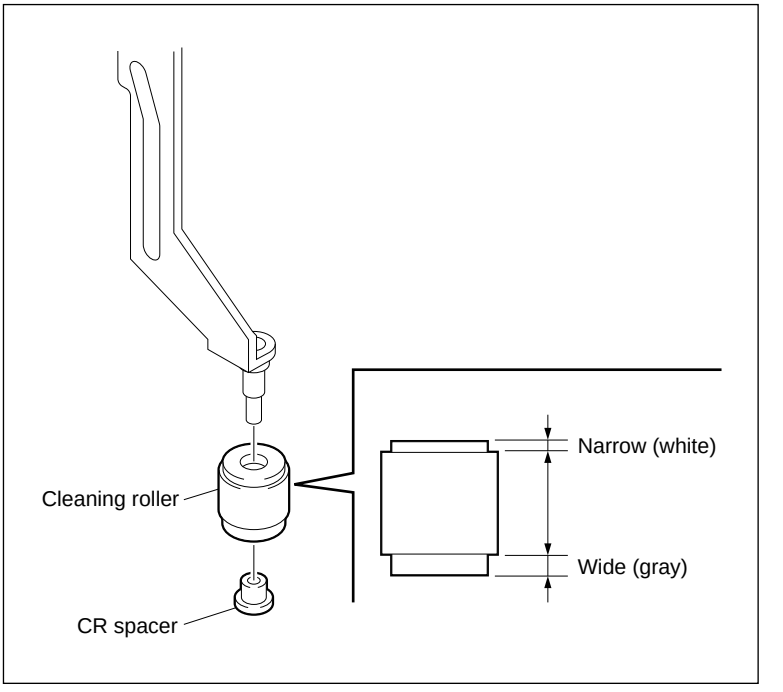
Remove the Video Head Cleaner Assembly

3. Replace the Cleaning Roller

(1) Remove the CR spacer, and remove the cleaning roller.
(2) Pass a new cleaning roller through the shaft as shown in the figure. Then fix the cleaning roller by new CR spacer.
(3) Move the cleaning roller in the vertical direction.
At this time, confirm that there is no vertical play.

Note

Do not reverse the direction of the cleaning roller. The height between the cleaing roller and head is shifted in this case.



Replace the Cleaning Roller

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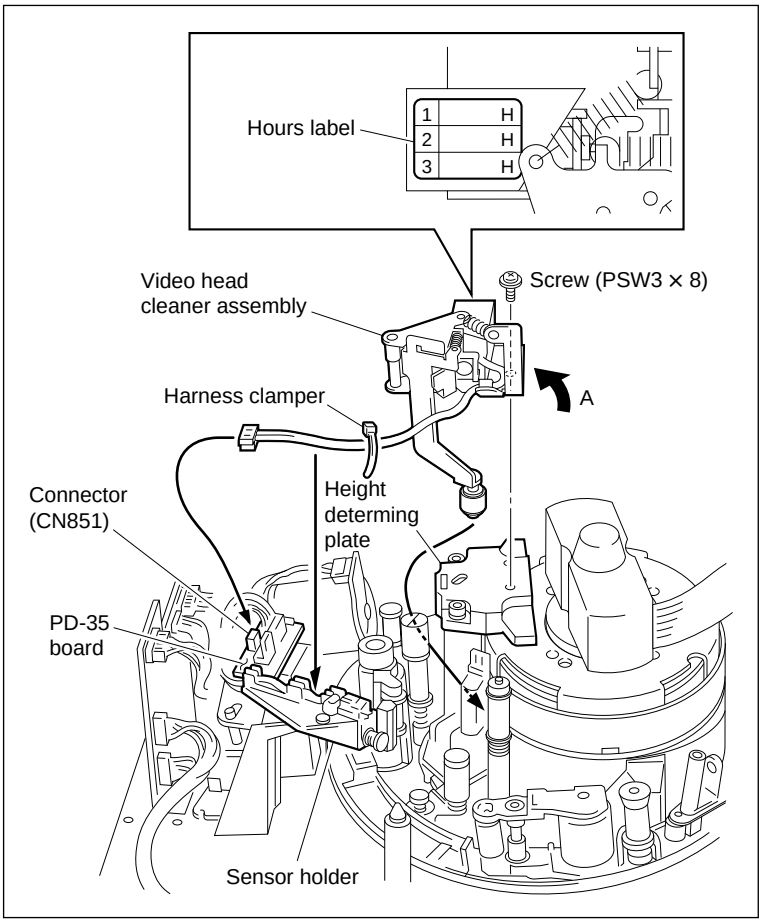
Installation

4. Install the Video Head Cleaner Assembly

(1) Insert the cleaning roller from the clearance between the height determing plate and the CTL head.
(2) Align the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while moving the video head cleaner assembly in the direction indicated by the arrow A (counterclookwise).
(4) Fill in the hours of the cleaning roller replacement on the hours label sticked on the video head cleaner assembly.



Install the Video Head Cleaner Assembly

5. Adjust the Cleaning Roller Position

(1) Check that the cleaning roller does not come in contact with the upper drum as visual. (Specification 1)

If the cleaning roller comes in contact with the upper drum, bend the portion B of the arm plate assembly in the direction of the arrow C.

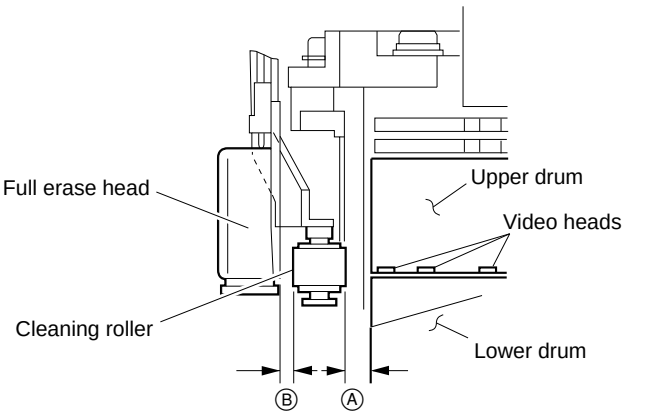
(2) Check that the cleaning roller does not come in contact with the terminal on the full erase head as visual. (Specification 2)

If the cleaning roller comes in contact with the terminal on the full erase head, bend the portion B of the arm plate assembly in the direction of the arrow D.

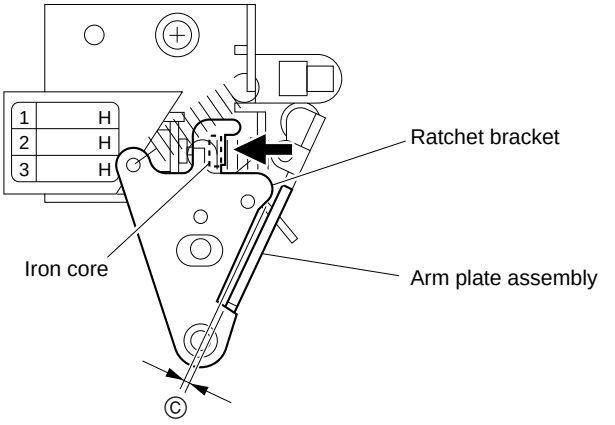
(3) Press the iron core in the direction of the arrow. At that time, check that clearance exists between the ratchet bracket and the arm plate assembly. (Specification 3)

If clearance does not exist, bend the portion B of the arm plate assembly in the direction of the arrow D.

(4) Repeat steps (1) through (3) above until the specifications 1 through 3 are satisfied.

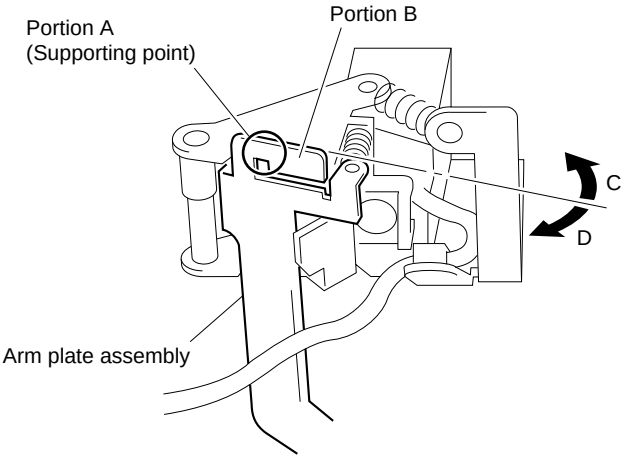


Spec. 1 : Ⓐ = Clearance exists.
Spec. 2 : Ⓑ = Clearance exists.



Spec. 3 : Ⓒ = Clearance exists.

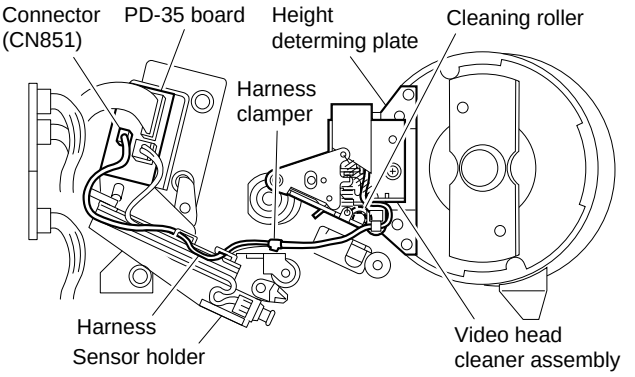
• When the specifications 1or 2 are not satisfied.



Adjust the Cleaning Roller Position

6. Install the Harness

(1) Fix the harness to the position on the sensor holder shown in the figure.
(2) Connect a harness on the video head cleaner assembly into connector CN851 on the PD-35 board.
(3) Bind the video head cleaner harness and the CTL head harness with the harness clamper (or equivalent).



Install the Harness

Adjustment after Replacement

7. Confirm the Cleaning Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C023: CLEANING ROLLER)

3-6. AT Head Cleaner Replacement

Replace the AT head cleaner every 2,000 hours of drum rotating.

Outline

Replacement

1. Remove the CL Arm Assembly
2. Install the CL Arm Assembly
3. Confirm the CL Arm Assembly Operation

Note

1. When the cleaning roller is dirty or damaged, replace the CL arm assembly.
2. Adjustment after the CL arm assembly replacement is not required. However, confirm the CL arm assembly operation.
3. When replacing the CL arm assembly, prepare a new stop washer.
   Stop washer(2.3):3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Removal

1. Remove the CL Arm Assembly

(1) Turn the M gear of the gear box assembly manually and move the CL arm assembly to the position shown in the figure.

Note

Move the CL arm assembly to the front of the SE-461 board. If not, the CL arm assembly cannot be removed because the stop washer is hidden by other parts.

(2) Remove the stop washer at the top of the CL arm assembly.

(3) Remove the CL arm assembly from the threading ring.

Note

Do not remove the spring at the bottom of the CL arm from the shaft.

Installation

2. Install the CL Arm Assembly

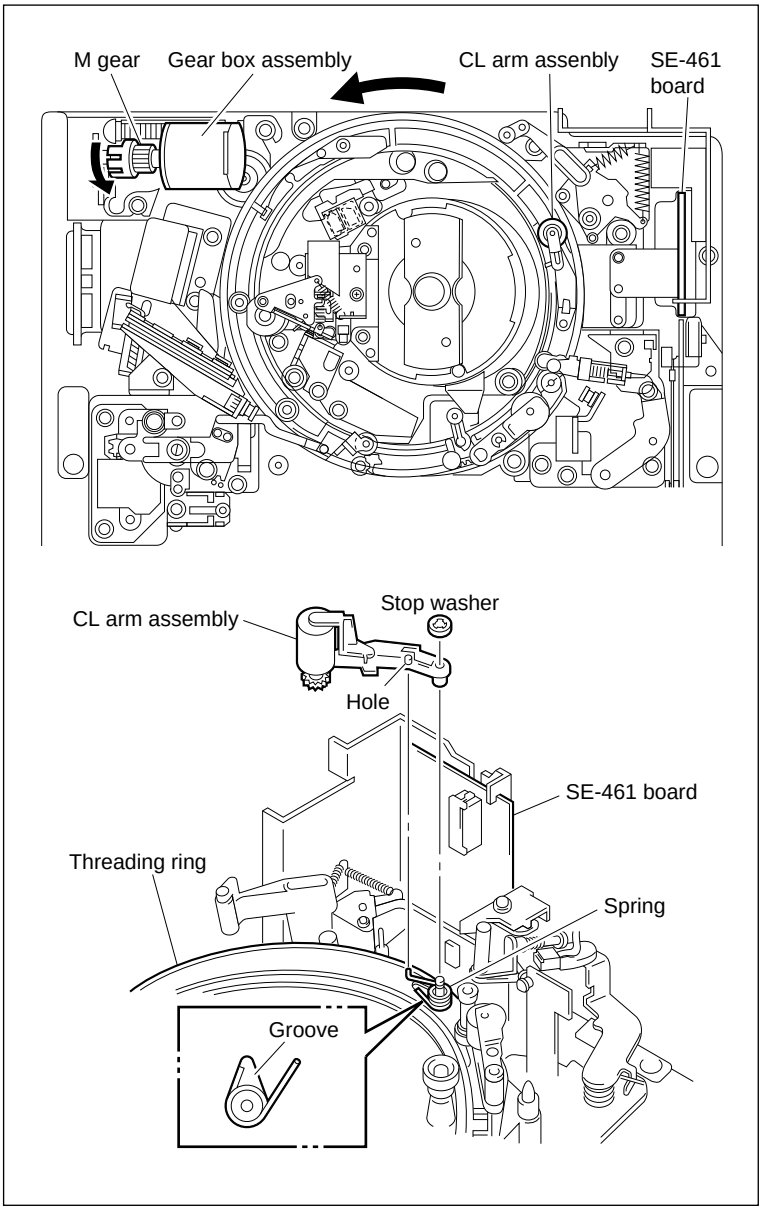
(1) Pass a new CL arm assembly through the shaft while hooking the spring as shown in the figure.

Note

Insert the short-end of the spring into the groove of the threading ring and the long-end spring into the hole of the CL arm assembly.

(2) Fix the CL arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00



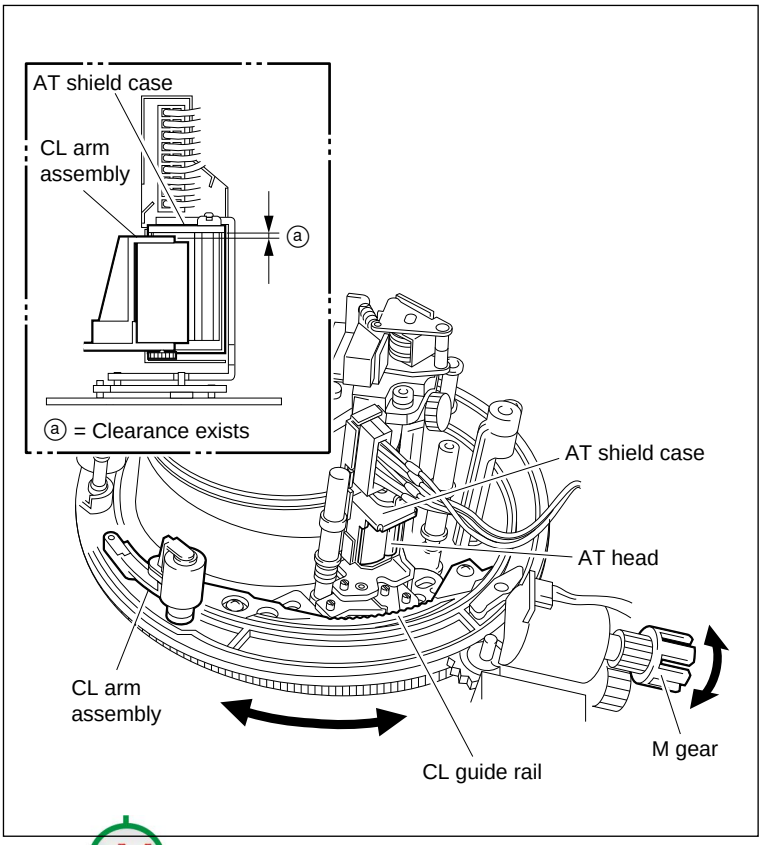
Remove the CL Arm Assembly

3. Confirm the CL Arm Assembly Operation

(1) Turn the M gear of the gear box assembly manually and confirm the items below while repeating the threading and unthreading.

- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the CL arm assembly and shield case while the AT head is cleaned.

(2) Turn the power on and confirm that the CL arm assembly smoothly operates while repeating the threading and unthreading.



gM **Confirm the CL Arm Assembly Operation**

3-7. CTL Head Replacement

Outline

Replacement

1. Disconnect the Connectors
2. Remove the CTL Head Assembly
3. Remove the CTL Head
4. Install the CTL Head
5. Install the CTL Head Assembly
6. Connect the Connectors
7. Cleaning (CTL Head Surface)

Adjustment after Replacement

8. Confirm the Tape Running (Refer to Section 4-1-2.)
9. Adjust the CTL Head Height (Refer to Section 4-1-4.)
10. Adjust the CTL Head Position (Refer to Section 4-1-5.)
11. Confirm the Tape Running (Refer to Section 4-1-2.)
12. Confirm the AT Head Position (Refer to Section 4-1-9.)
13. Adjust the Drum Phase (Refer to Section 5-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kgf•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver's bit (+2 mm, l = 75 mm) : J-6323-420-A

Removal

1. Disconnect the Connector

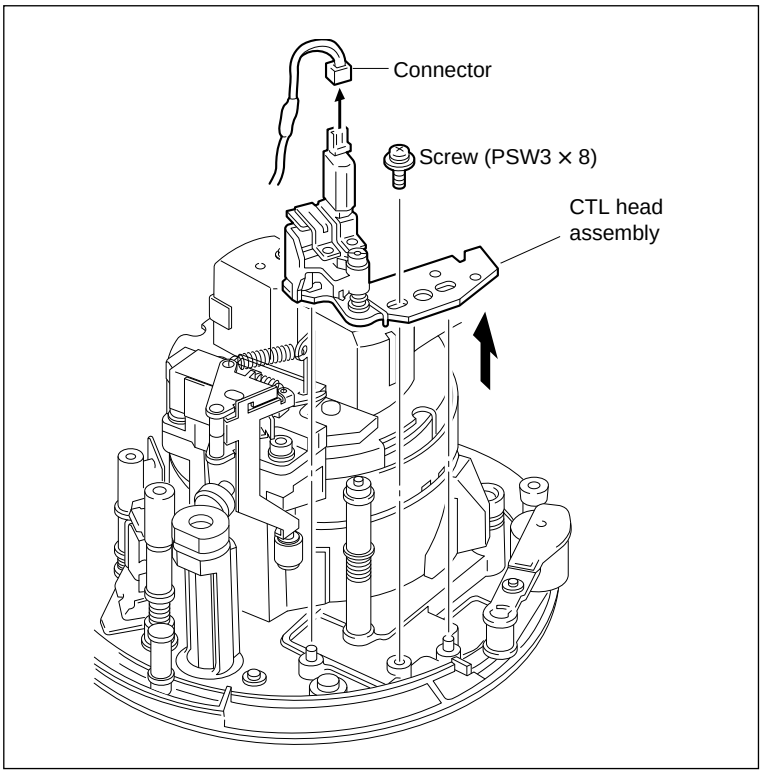
Disconnect the connectors on the CTL head board.

2. Remove the CTL Head Assembly

Remove the screw, then remove the CTL head assembly.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the CTL Head Assembly

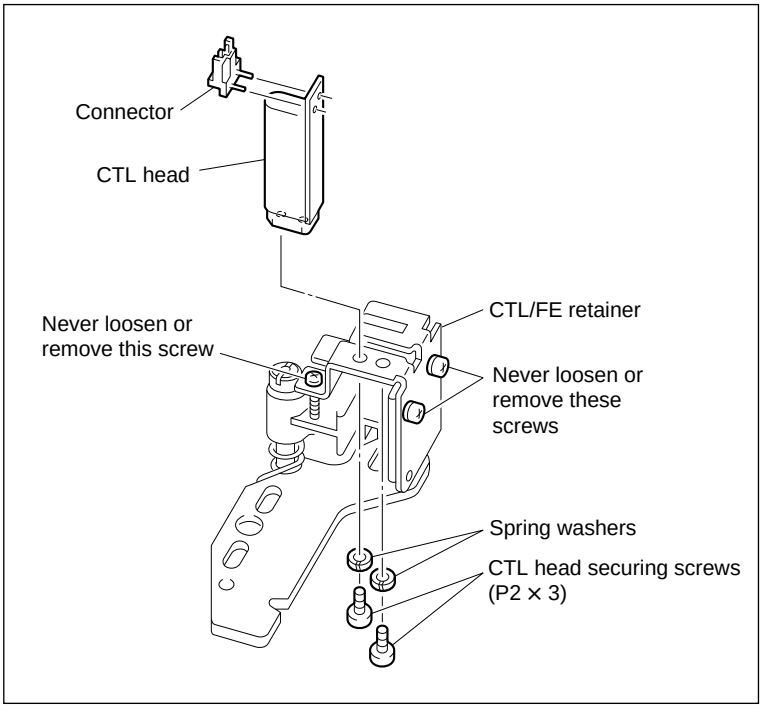
3. Remove the CTL Head

(1) Remove the two CTL head securing screws, then remove the CTL head.

Notes

- Never loosen or remove the screws except for the CTL head securing screws. If these screws are loosened or removed, the zenith of the CTL head will be out of specification.

(2) Unsolder the connector pins.



Remove the CTL Head

Installation

4. Install the CTL Head

(1) Solder the connector pin to the CTL head board.

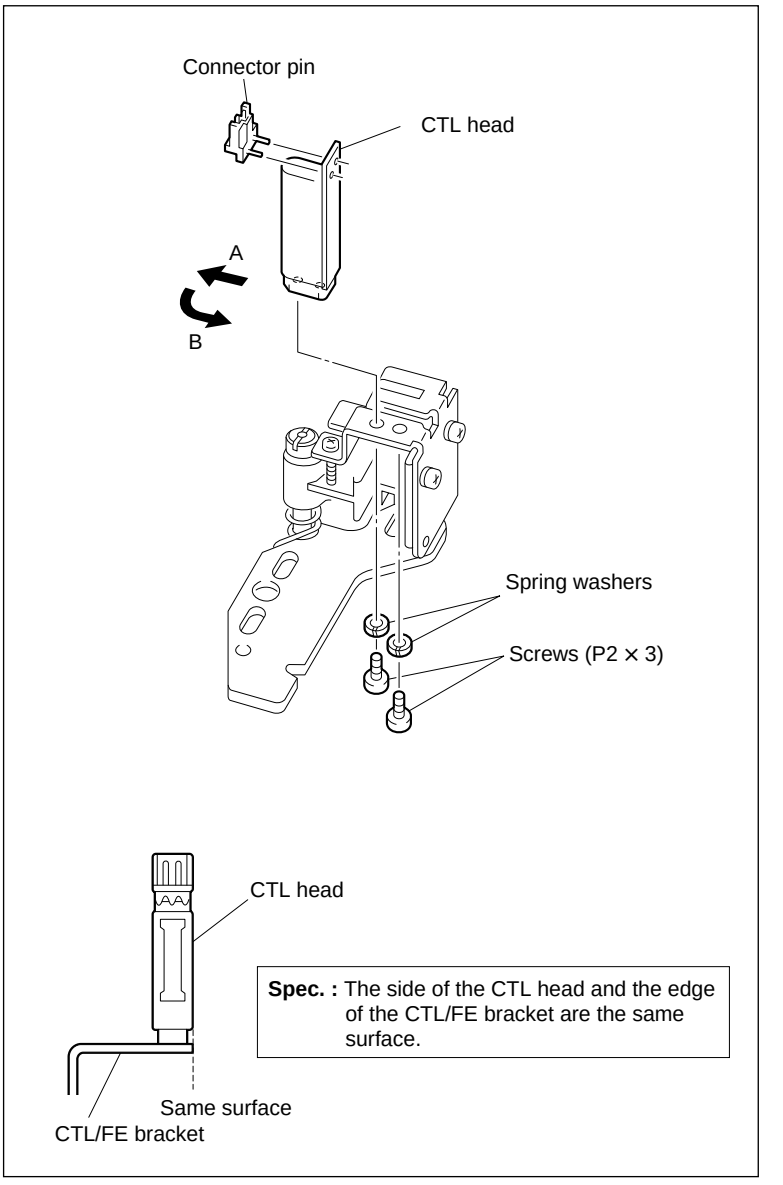
(2) Tighten the two screws temporarily while moving the CTL head in the direction indicated by arrows A and B.

Note

Be careful not to damage the CTL head.

(3) Tighten the two screws if it is within the specification.

Tightening torque : 19.6×10^{-2} N•m (2.0 kgf•cm)



Install the CTL Head

5. Install the CTL Head Assembly

(1) Confirm that the threading ring is in the unthreading end state.

(2) Align the longitudinal holes A and B of the CTL head assembly with the bosses of the chassis.

Note

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.

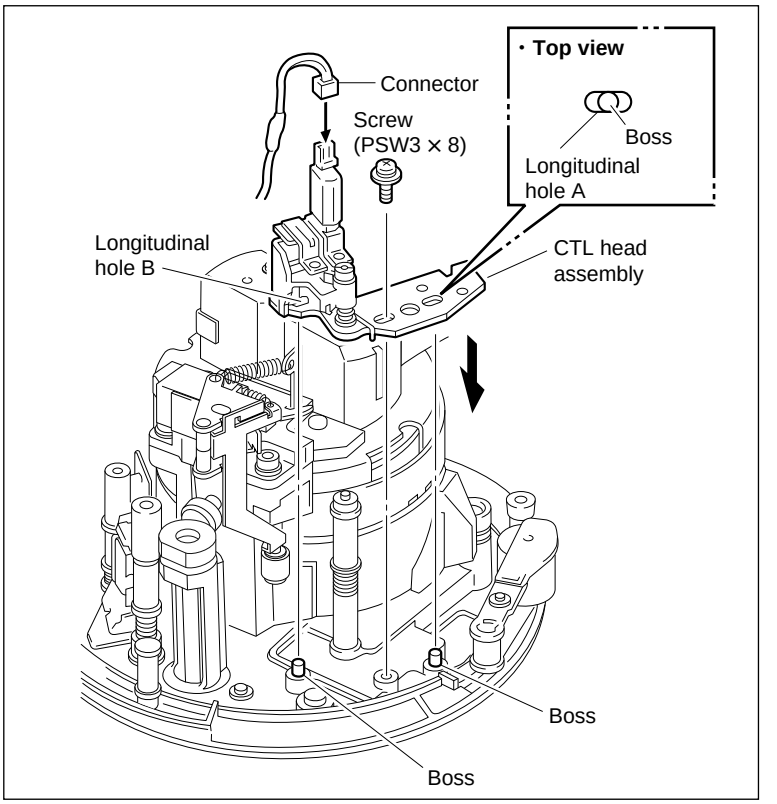
(3) Align the boss of the chassis with center of the longitudinal hole A and tighten the screw.

6. Connect the Connector

Connect the connectors to the CTL head board.

7. Cleaning

Clean the tape running surface of the CTL head with a cleaning cloth moistened with cleaning fluid.



Install the CTL Head Assembly

Adjustment after Replacement

8. Confirm the Tape Running

Refer to Section 4-1-2.

9. Adjust the CTL Head Height

Refer to Section 4-1-4.

10. Adjust the CTL Head Position

Refer to Section 4-1-5.

11. Confirm the Tape Running

Refer to Section 4-1-2.

12. Confirm the A/T Head Position

Refer to Section 4-1-9.

13. Adjust the Drum Phase

Refer to Section 5-2.

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3-9. AT Head Replacement

Outline

Replacement

1. Remove the CL Guide Rail
2. Disconnect the Connector
3. Remove the AT Head Assembly
4. Remove the AT Head
5. Install the AT Head
6. Install the AT Head Assembly
7. Connect the Connector
8. Install the CL Guide Rail
9. Cleaning (AT Head Surface)

Adjustment after Replacement

10. Adjust the AT Head Zenith (Refer to Section 4-1-1.)
11. Adjust the Tape Running (Refer to Section 4-1-2.)
12. Adjust the AT Head Height (Refer to Section 4-1-6.)
13. Adjust the AT Head Azimuth (Refer to Section 4-1-7.)
14. Adjust the AT Head Head-to-tape Contact (Refer to Section 4-1-8.)
15. Adjust the AT Head Position (Refer to Section 4-1-9.)
16. Confirm the Audio Level in REV Mode (Refer to Section 4-1-10.)
17. Confirm the Video Tracking (Refer to Section 4-1-3.)
18. Confirm the Tape Running (Refer to Section 4-1-2.)
19. Perform the Electrical Adjustment after AT Head Replacement (Refer to Section 5.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part 1.)

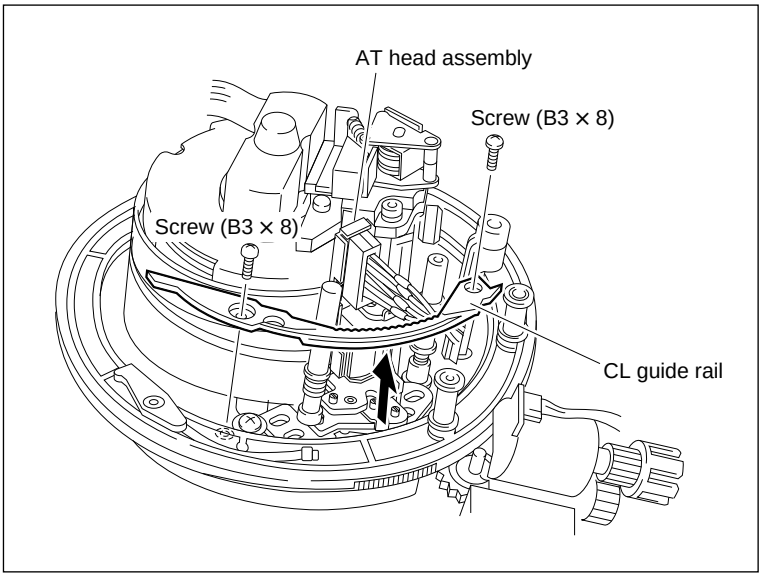
Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- Torque screwdriver (6 kg•cm) (JB-5251) : J-6252-510-A
- Torque screwdriver+s bit (+2 mm, l = 75 mm) : J-6323-420-A

Removal

1. Remove the CL Guide Rail

Unscrew the two screws, and remove the CL guide rail.



Remove the CL Guide Rail

2. Disconnect the Connector

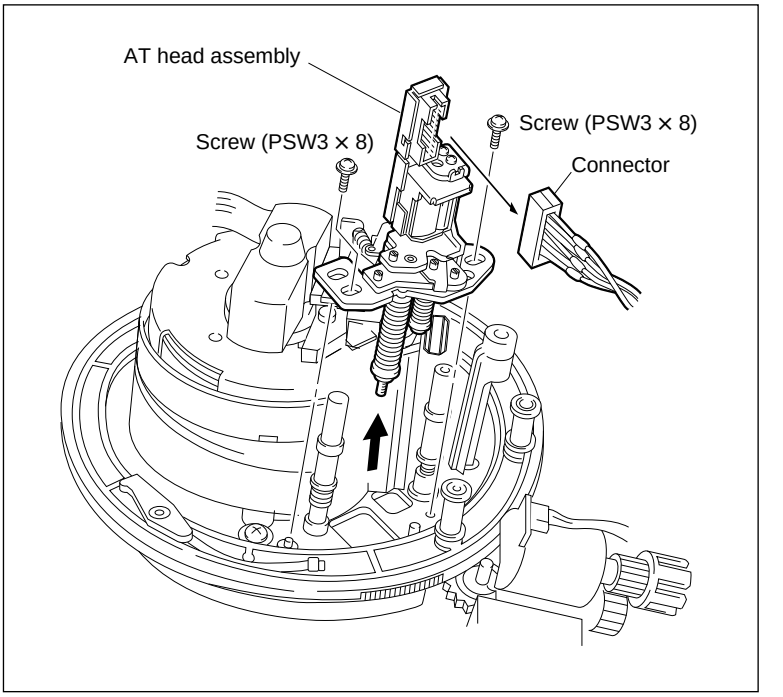
Disconnect a connector on the AT head board.

3. Remove the AT Head Assembly

Remove the two screws, then remove the AT head assembly from the unit.

CAUTION

Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.



Remove the AT Head Assembly

4. Remove the AT Head

(1) Remove the two screws, then remove the AT head and adjustment plate from the AT bracket.
(2) Remove the AT shield case.
(3) Remove the AT shield plate by opening the two claws using the long-nose plier.

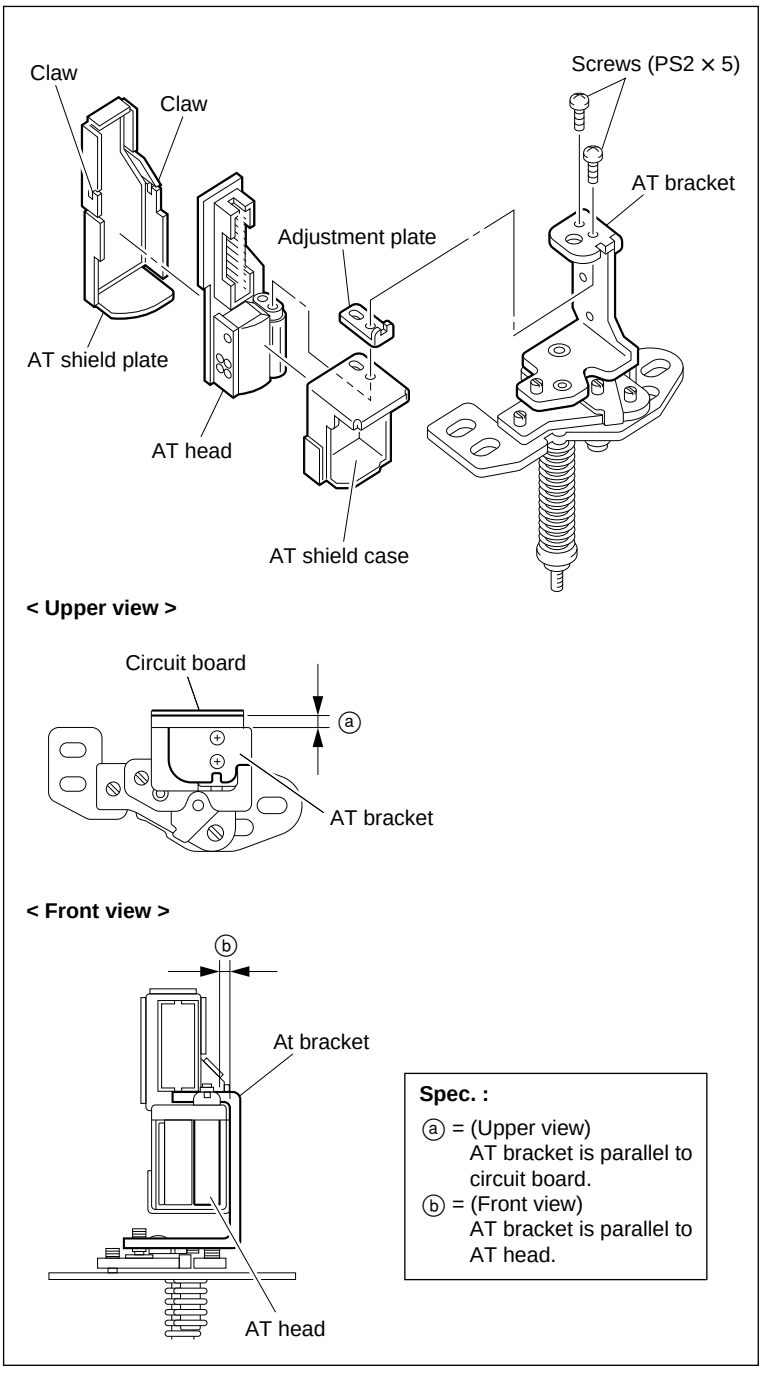
Installation

5. Install the AT Head

(1) Put a new head into the AT shield case and align the hole positions.
(2) Align the hole positions while putting the adjustment plate between the AT head and the AT bracket, then tighten the two screws tentatively.
(3) Tighten the screws after confirming that the specification is satisfied.

Tightening torque: 19.6×10^{-2} N • m
(2.0 kg • cm)

(4) Cover the AT shield plate on the AT head board.
Then, fix the AT shield plate by bending the two claws using the long-nose plier.



Remove/Install the AT Head

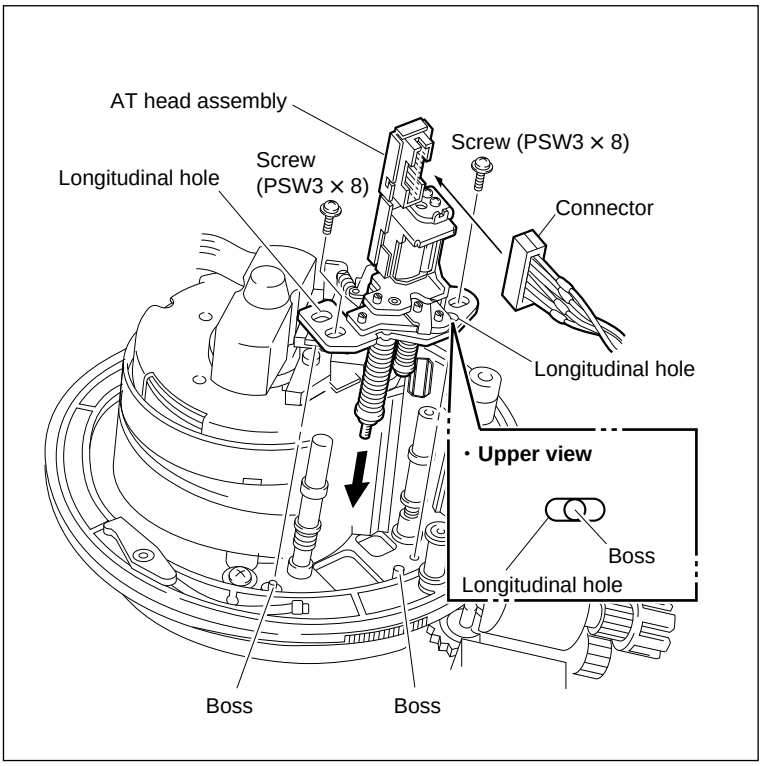
6. Install the AT Head Assembly

(1) Align the two longitudinal holes of the AT head assembly with the two bosses of the chassis.

CAUTION

- Be careful not to touch the drum (especially video heads). Also, take care not to damage the peripheral tape guides.
- Be careful not to damage the AT head surface.

(2) Align the bosses of the chassis with center of the longitudinal holes and tighten the two screws.



Install the AT Head Assembly

7. Connect the Connector

Connect a connector into the AT head board.

8. Install the CL Guide Rail

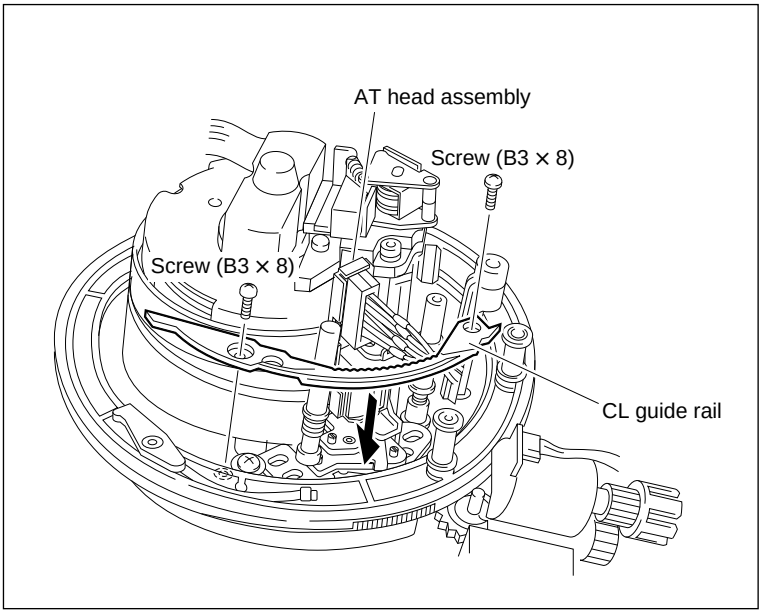
Install the CL guide rail using the two screws.

9. Cleaning

Clean the AT head surface with a cleaning cloth moistened with cleaning fluid.

CAUTION

After cleaning, wipe with a dry cleaning cloth.



Install the CL Guide Rail

Adjustment after Replacement

10. Adjust the AT Head Zenith
Refer to Section 4-1-1.

11. Adjust the Tape Running
Refer to Section 4-1-2.

12. Adjust the AT Head Height
Refer to Section 4-1-6.

13. Adjust the AT Head Azimuth
Refer to Section 4-1-7.

14. Adjust the AT Head Head-to-tape Contact
Refer to Section 4-1-8.

15. Adjust the AT Head Position
Refer to Section 4-1-9.

16. Confirm the Audio Level in REV Mode
Refer to Section 4-1-10.

17. Confirm the Video Tracking
Refer to Section 4-1-3.

18. Confirm the Tape Running
Refer to Section 4-1-2.

19. Perform the Electrical Adjustment after AT Head Replacement
Refer to Section 5.

3-10. Pinch Roller Replacement

Replace the pinch roller every 2,000 hours of the tape running.

Outline

Replacement

1. Remove the Pinch Arm Assembly
2. Install the Pinch Arm Assembly
3. Adjust the Pinch Arm Assembly Vertical Play
4. Cleaning (Pinch Roller Surface)

Adjustment after Replacement

5. Confirm the Tape Running (Refer to Section 4-1-2.)
6. Confirm the AT Head Height (Refer to Section 4-1-6.)
7. Confirm the AT Head Azimuth (Refer to Section 4-1-7.)

Notes

1. When the pinch roller is damaged or worn, replace the pinch roller assembly.
2. When replacing the AT head cleaner, prepare a new stop washer.
   Stop washer(2.3) : 3-669-596-00

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- Thickness gauge : 9-911-053-00
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

Removal

1. Remove the Pinch Arm Assembly

(1) Remove the stop washer at the top of the pinch arm.

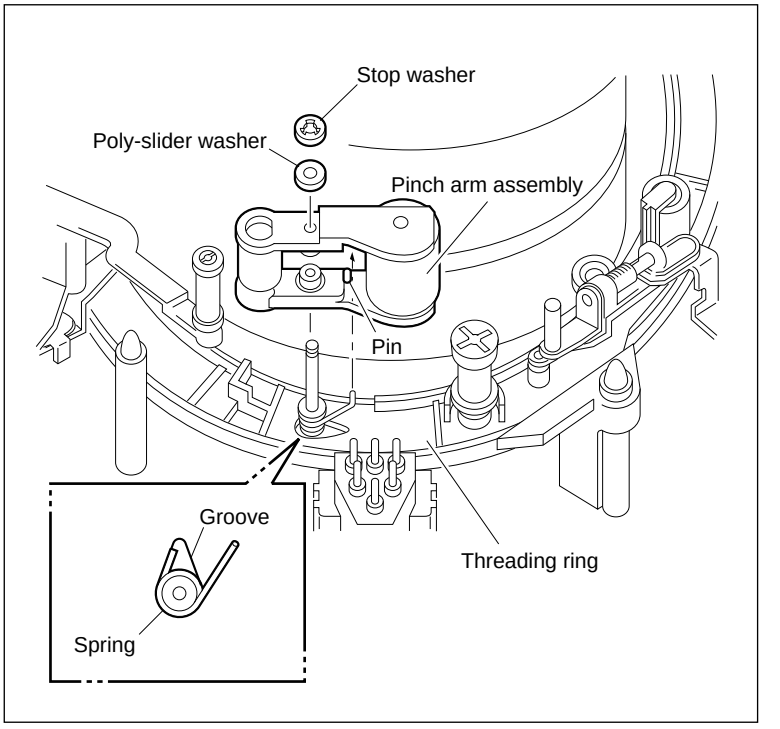
Note

If a poly-slider washer is inserted between the pinch arm assembly and the stop washer, be carefull not to lose the poly-slider washer. This poly-slider washer is used for vertical play adjustment.

(2) Remove the pinch arm assembly from the threading ring.

Note

Do not remove the poly-slider washer and spring at the bottom of the pinch arm assembly from the shaft.



Remove/Install the Pinch Arm Assembly

Installation

2. Install the Pinch Arm Assembly

(1) Pass a new pinch arm assembly through the shaft while hooking the spring as shown in the figure.

Notes

- Insert the short-end spring into the groove of the threading ring and hook the long-end spring to the side surface (drum side) of the pinch arm assembly.
- If the poly-slider washer was removed at the step 1, pass the same poly-slider washer through the shaft again.

(2) Fasten the pinch arm assembly by new stop washer.

Stop washer (2.3) : 3-669-596-00

(3) Push the pinch arm assembly manually in the direction of the drum, then release. At that time, confirm that the pinch arm assembly smoothly returns to the former position.

3. Adjust the Pinch Arm Assembly Vertical Play

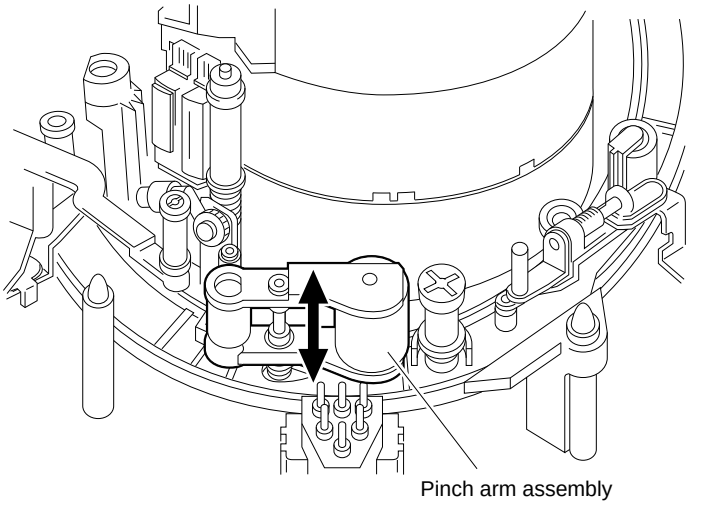
Move the pinch arm assembly in the vertical direction.
At this time, confirm that the vertical play satisfies the specification.

If the specification is not satisfied, perform the adjustment below.

(1) Remove the stop washer.
(2) Install or remove the poly-slider washer at the upper of the pinch arm.
(3) Fasten the pinch arm assembly by new stop washer, confirm again that the specification is satisfied.

4. Cleaning

Clean the pinch roller's cylindrical surface with a cleaning cloth moistened with cleaning fluid.



Spec. : Vertical play
0.05 mm to 0.2 mm

∗ When the specification is not satisfied.

• Poly-slider washer for adjustment

Diameter	Thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11

Adjust the Pinch Arm Assembly Vertical Play

Adjustment after Replacement

5. Confirm the Tape Running

Refer to Section 4-1-2.

6. Confirm the AT Head Height

Refer to Section 4-1-6.

7. Confirm the AT Head Azimuth

Refer to Section 4-1-7.

3-11. Pinch Solenoid Replacement

Replace the pinch solenoid earlier time either 6,000 hours of tape running or 200,000 times of the threading.

3-11-1. Replacement Procedure of the Pinch Solenoid

Outline

Replacement

1. Disconnect the Connector (CN851 and CN854/PD-35 Board)
2. Remove the Pinch Press Assembly
3. Remove the PD-35 Board
4. Remove the Pinch Stopper
5. Remove the Pinch Solenoid
6. Install the Pinch Solenoid
7. Install the Pinch Stopper
8. Install the PD-35 Board
9. Install the Pinch Press Assembly
10. Connect the Connector (CN851 and CN854/PD-35 Board)

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C020: PINCH ROLLER)
12. Adjust the Pinch Press Clearance (Refer to Section 3-11-2.)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)

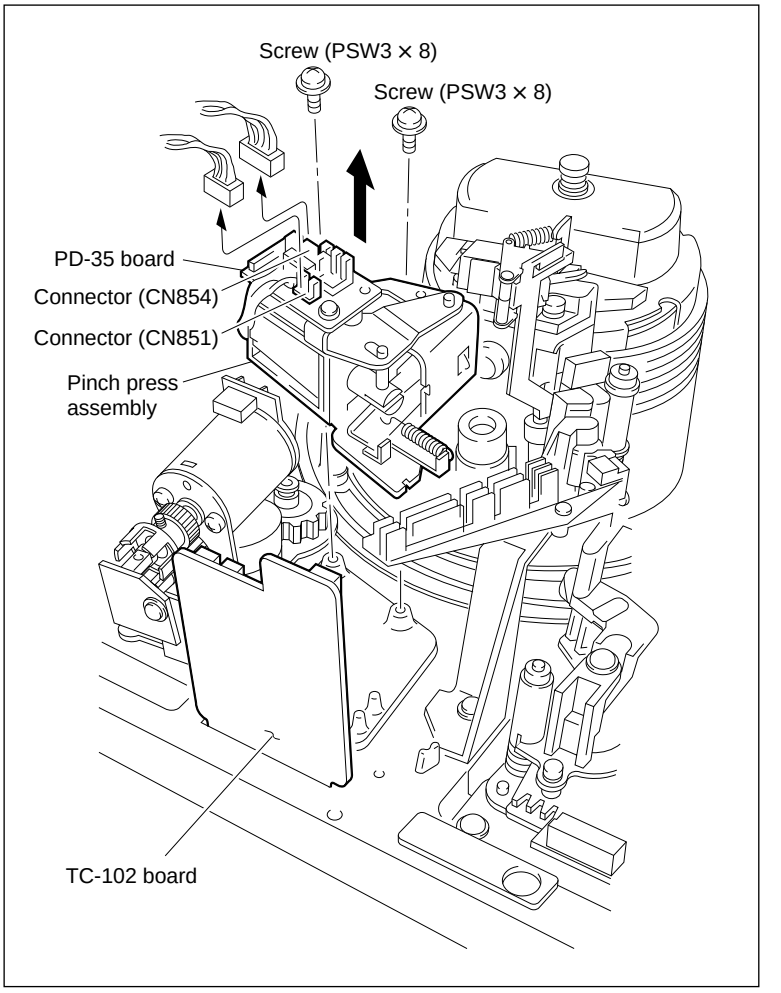
Removal

1. Disconnect the Connector

Disconnect the connectors CN851 and CN854 on the PD-35 board.

2. Remove the Pinch Press Assembly

Remove the two screws, then remove the pinch press assembly from the unit.



Remove the Pinch Press Assembly

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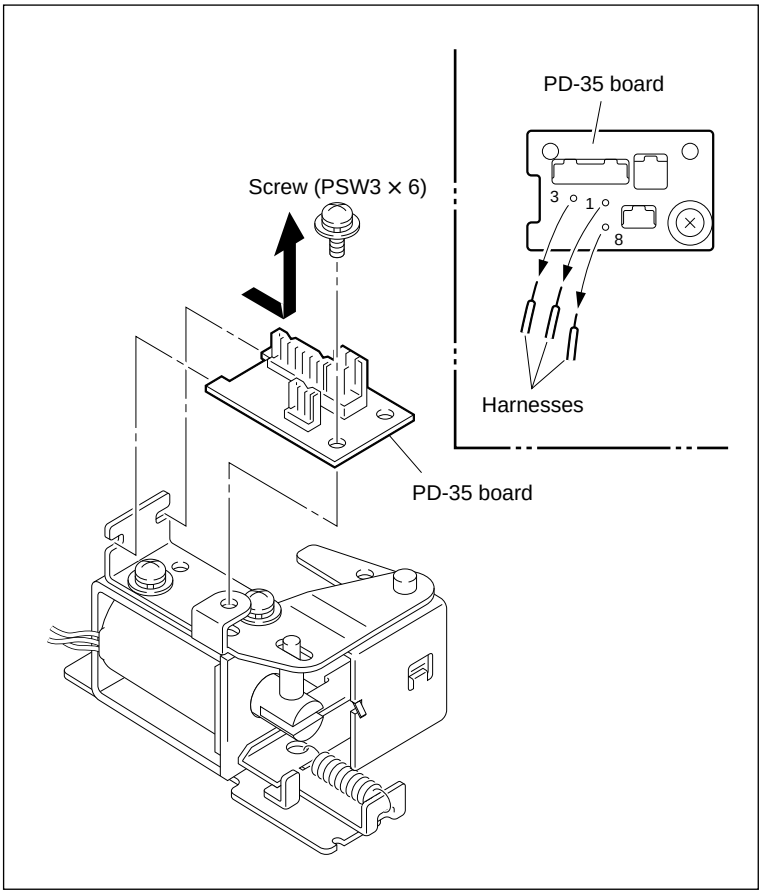
3. Remove the PD-35 Board

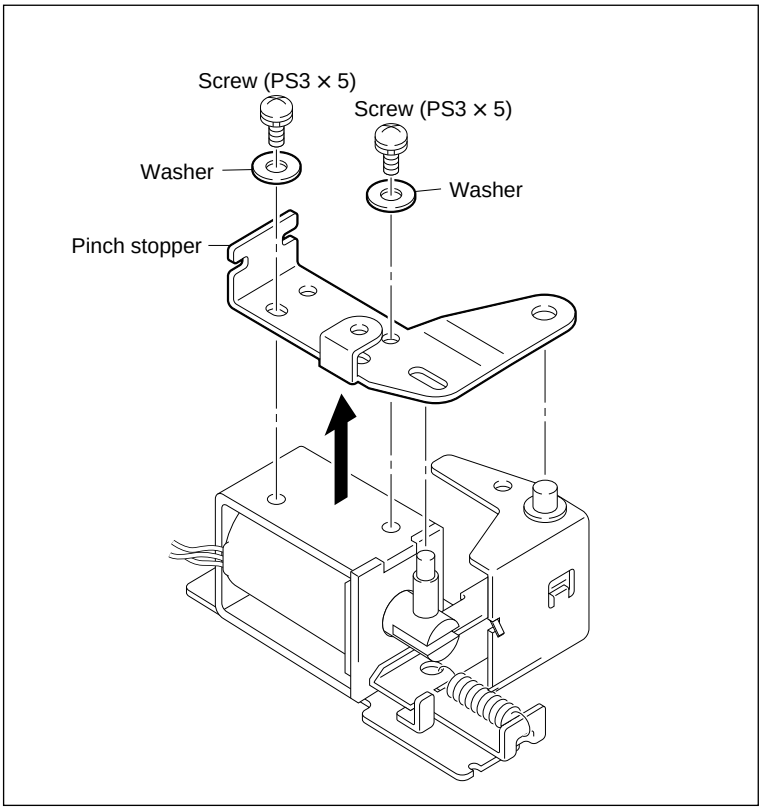
(1) Remove the screw, then remove the PD-35 board from the pinch press assembly.
(2) Unsolder the three harness soldered on the PD-35 board.



Remove the PD-35 Board

4. Remove the Pinch Stopper

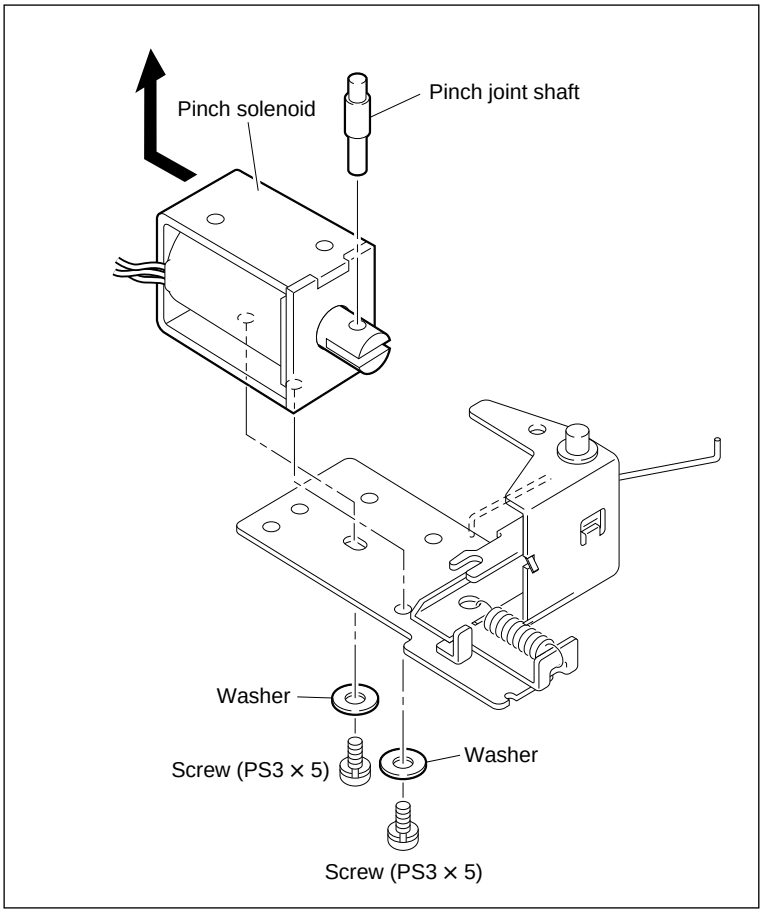
Remove the two screws and washers, then remove the Pinch stopper.



Remove the Pinch Stopper

5. Remove the Pinch Solenoid

(1) Extract the Pinch joint shaft.
(2) Remove the two screws and washers, then remove the pinch solenoid.



Remove the Pinch Solenoid

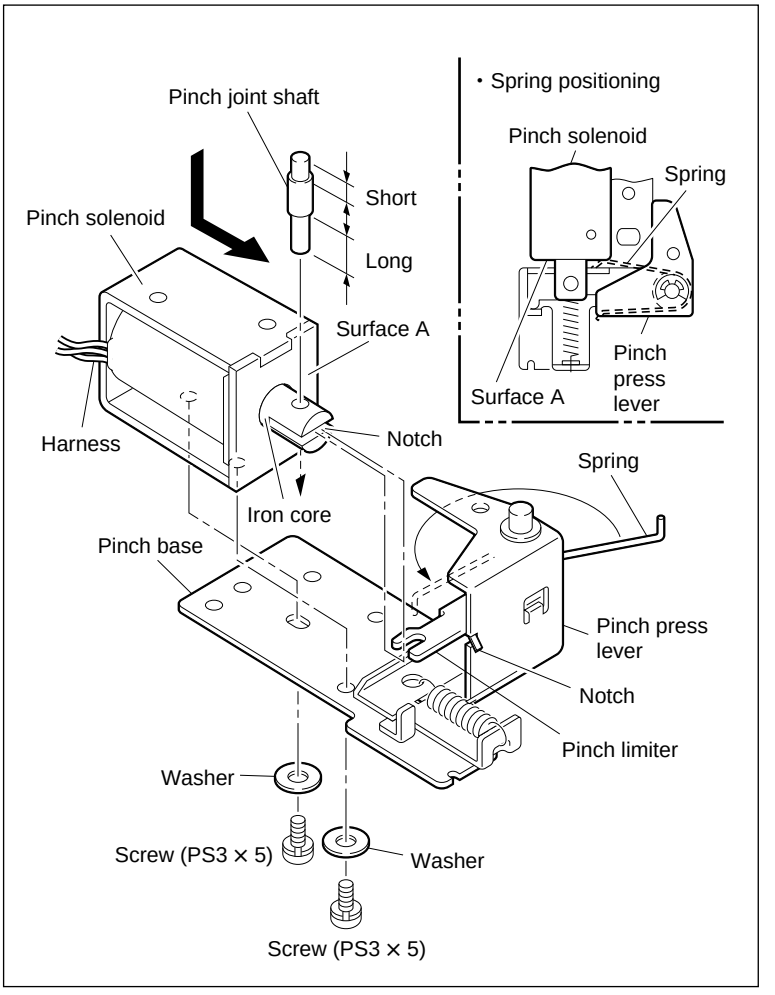
Installation

6. Install the Pinch Solenoid

(1) Install a new solenoid to the Pinch base in the direction shown in the figure.
(2) Bend the spring in the direction indicated by the arrow and bring it into contact with surface A of the solenoid shown in the figure.
(3) Put the pinch limiter into the notch of the solenoid's iron core and pass the pinch joint shaft through the hole of the iron core in the direction shown in the figure.
(4) Put the two washers and tighten the two screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

(5) Confirm that the other end of the spring is put on the notch of the pinch press lever.



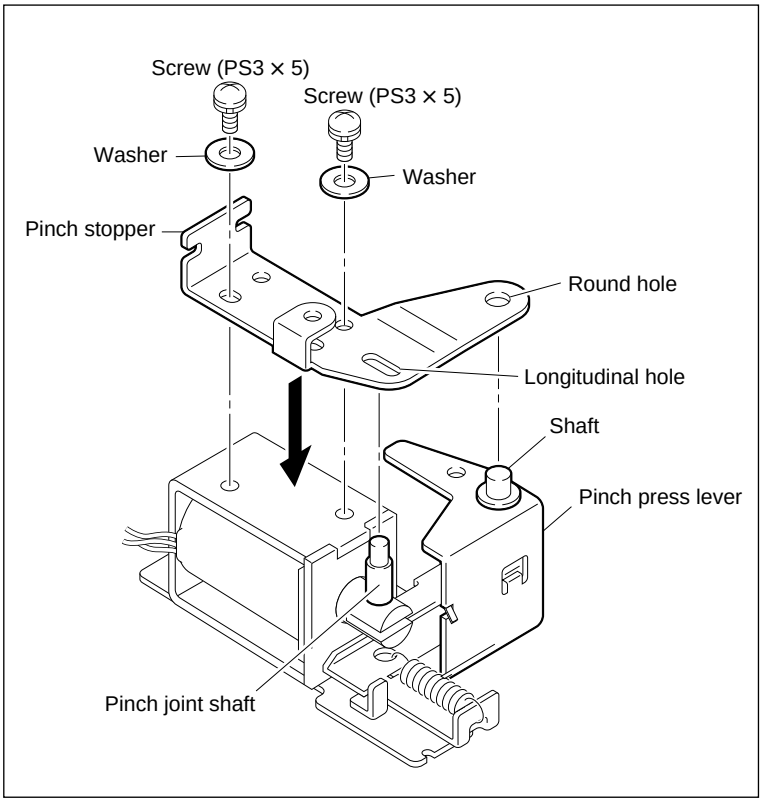
Install the Pinch Solenoid

7. Install the Pinch Stopper

(1) Pass the longitudinal hole of the pinch stopper to the pinch joint shaft, then pass the round hole to the shaft of the Pinch press lever.

(2) Put the washers and tighten the screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

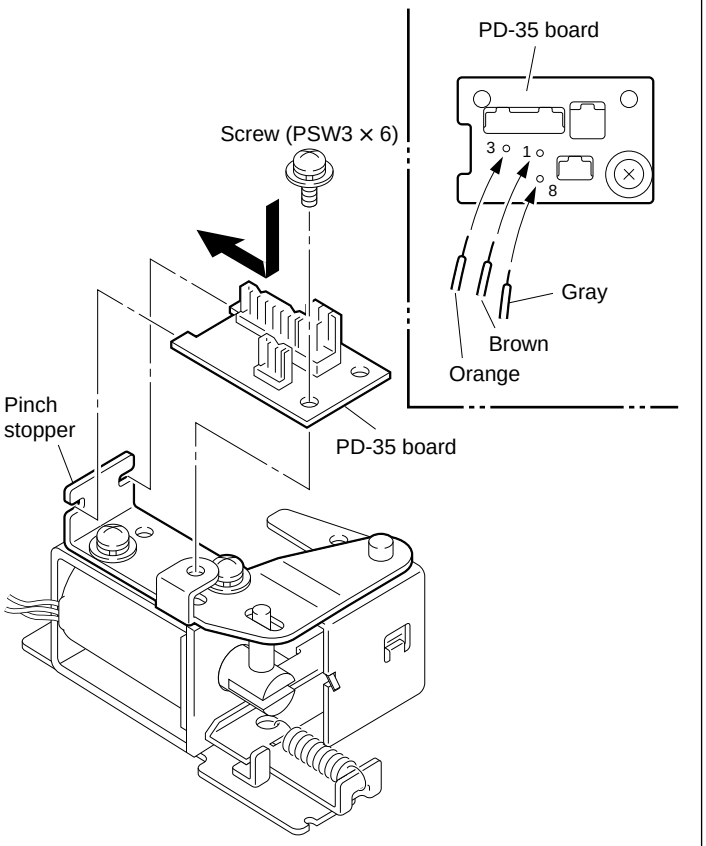


Install the Pinch Stopper

8. Install the PD-35 Board

(1) Wire the harness to the PD-35 board as shown in the figure, then solder.

(2) Insert the PD-35 board into the pinch stopper and tighten the screw.



• Harness wiring

Print on board	Harness
1	Brown
3	Orange
8	Gray

Install the PD-35 Board

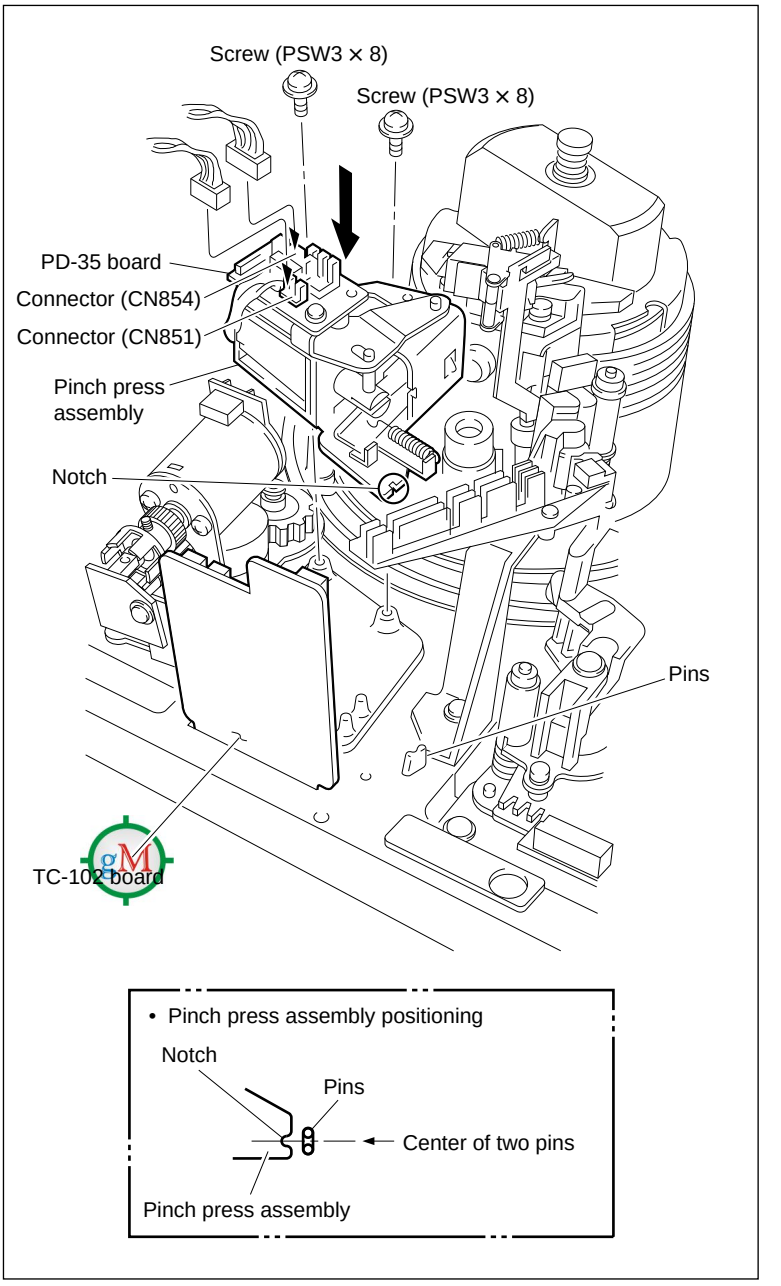
9. Install the Pinch Press Assembly

Align the notch of the pinch press assembly with the center of the two pins and tighten the two screws.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

10. Connect the Connector

Connect the harnesses into the connectors CN851 and CN854 on the PD-35 board.



Install the Pinch Press Assembly

Adjustment after Replacement

11. Confirm the Pinch Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C020: PINCH ROLLER)

12. Adjust the Pinch Press Clearance

Refer to Section 3-11-2.

3-11-2. Pinch Press Clearance Adjustment

Note

- Be sure to check the clearance at pinch press is energized state when the pinch press assembly is removed.

Tool

- Wire clearance check gauge set: J-6152-450-A

Check

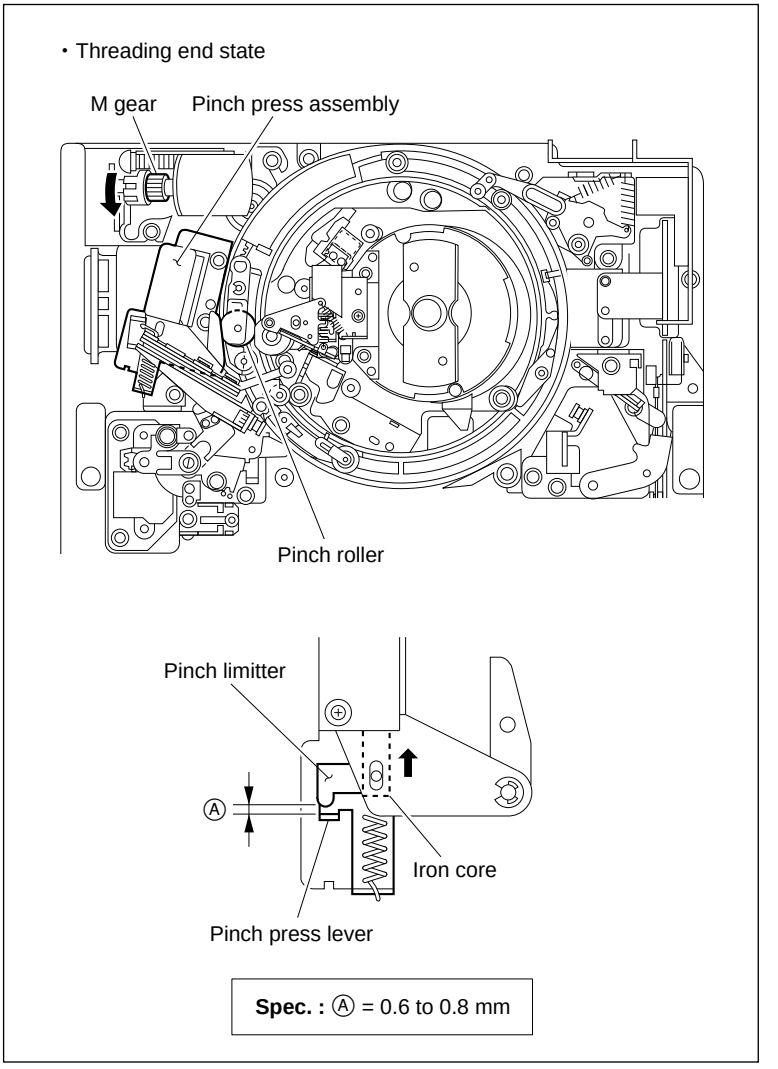
1. Put the Pinch Solenoid into the Energized State

(1) Turn the M gear of the gear box assembly manually, and put the unit into the threading end mode.
(2) Press the iron core of the pinch solenoid in the direction of the fully energized state.

2. Check the Pinch Press Clearance

Check that the clearance between the pinch limiter and pinch press lever satisfies the specification.

If the specification is not satisfied, perform steps 3 and later.



Pinch Press Clearance Check

Adjustment

3. Loosen the Screws

Loosen the two screws securing the pinch press assembly by 1/2 to one turn.

4. Adjust the Pinch Press Assembly Position

Put the pinch solenoid into the energized state, then insert the tip of a 3 mm flat-blade screwdriver into the notch of the pinch press assembly and adjust the pinch press assembly position so that the specification is satisfied.

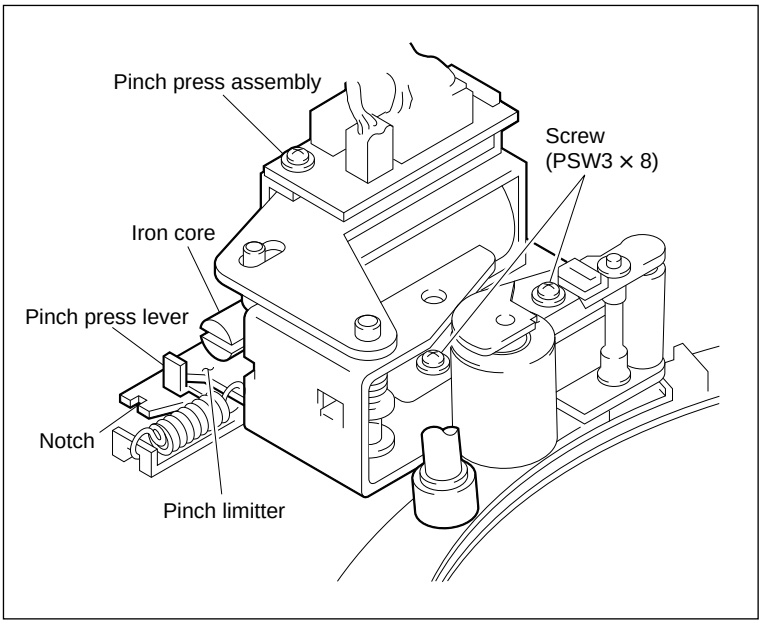
5. Tighten the Screws

Tighten the two screws loosened in step 3.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

6. Recheck the Pinch Press Clearance

Refer to steps 1 and 2.



Adjust the Pinch Press Clearance

3-12. Capstan Motor Replacement

Replace the capstan motor every 6,000 hours of tape running.

Outline

Replacement

1. Remove the Shield Plate (Bottom)
2. Remove the DT-34D Board
3. Remove the DR-315 Board
4. Remove the Video Head Cleaner Assembly
5. Remove the Demagnetization Head Assembly
6. Remove the Capstan Motor
7. Install the Capstan Motor
8. Install the DR-315 Board
9. Install the DT-34D Board
10. Install the Shield Plate (Bottom)
11. Install the Demagnetization Head Assembly
12. Install the Video Head Cleaner Assembly
13. Cleaning (Capstan Motor Shaft)

Adjustment after Replacement

14. Confirm the Pinch Press Clearance (Refer to Section 3-11-2.)
15. Confirm the Tape Running (Refer to Section 4-1-2.)
16. Perform the Capstan Motor Operation Check (Refer to Section 4-2 of the maintenance manual part 1.) (C014: CAPSTAN MOTOR)
17. Perform the Capstan FG Duty Adjust (Refer to Section 4-2 of the maintenance manual part 1.) (A003: CAPSTAN FG DUTY)
18. Perform the Capstan Free Speed Adjust (Refer to Section 4-2 of the maintenance manual part 1.) (A010: CAPSTAN SPEED)
19. Perform the Adjusted Data Save (Refer to Section 4-2 of the maintenance manual part 1.) (A012: NV-RAM CONTROL)

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4-2 of the maintenance manual part 1.)
4. Remove the cassette compartment.
   (Refer to Section 2-5 of the maintenance manual part 1.)
5. Remove the bottom plate with the right side panel of the unit down.
   (Refer to Section 2-3-1 of the maintenance manual part 1.)

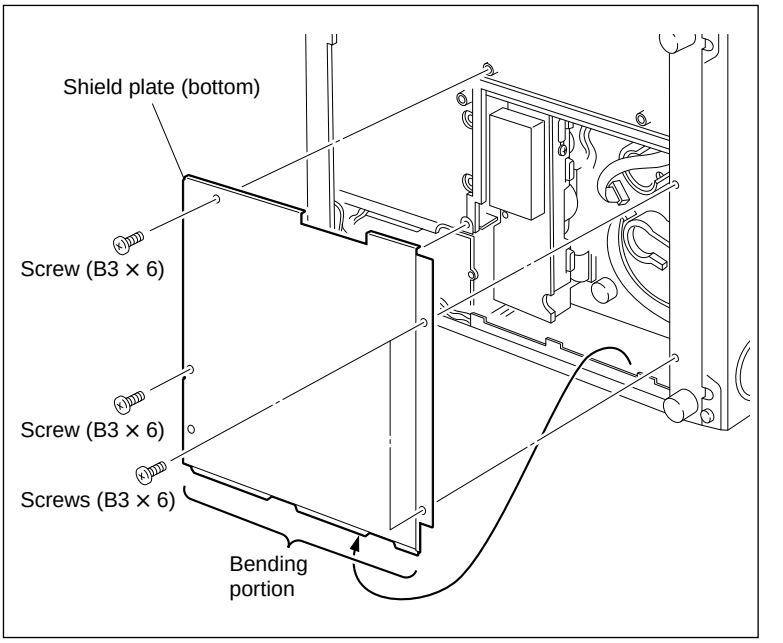
Tools

- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01
- L shaped hex. wrench (d = 2.5 mm) : 7-700-736-04

Removal

1. Remove the Shield Plate (Bottom)

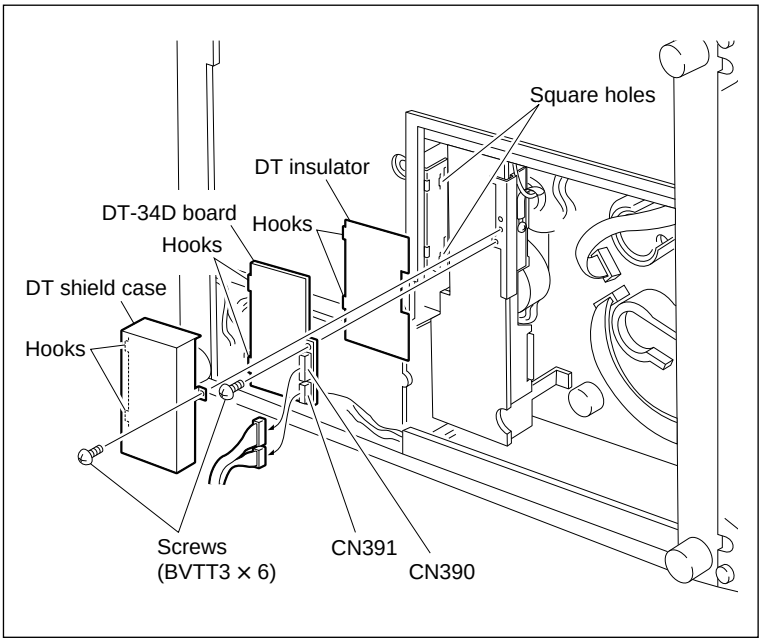
Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

2. Remove the DT-34D Board

(1) Remove a screw, remove the two hooks from the square holes of the chassis, and then remove the DT shield case.
(2) Disconnect the harnesses from connectors CN390 and CN391 on the DT-34D board.
(3) Remove a screw, remove the two hooks from the square holes of the chassis, and then remove the DT-34D board and DT insulator.



Remove the DT-34D Board

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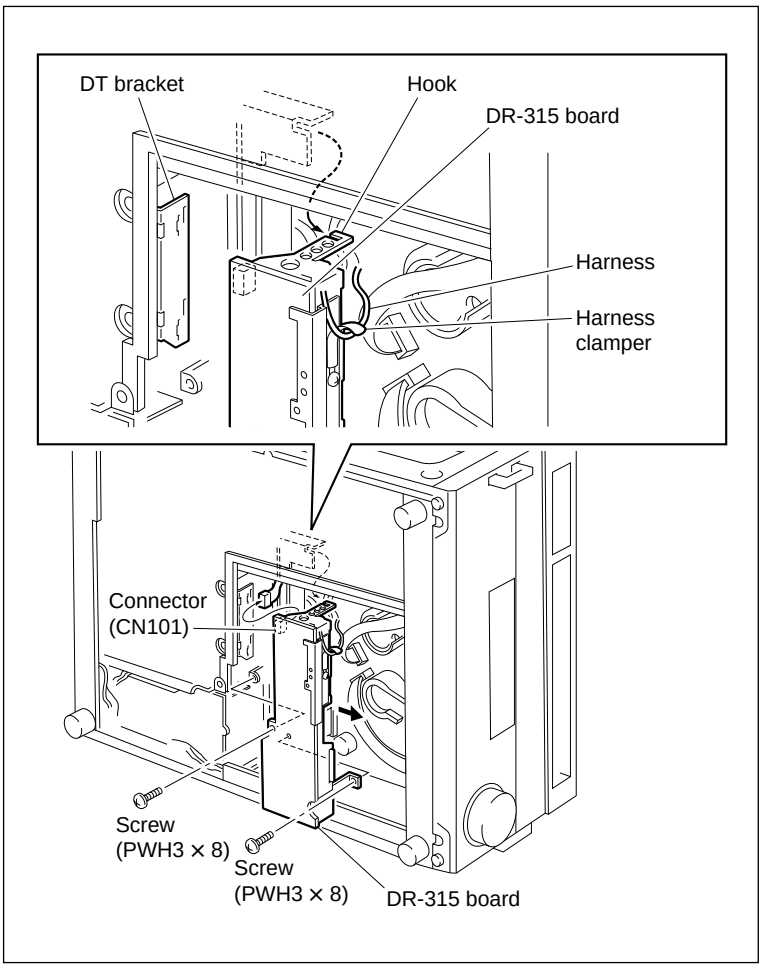
3. Remove the DR-315 Board

(1) Open the harness clamper on the DR-315 board and release the bundled harness.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board in the direction of the reel table by about 1 cm and remove the hook.

Note

The hook is difficult to view because it is located in the inner part.

(4) Disconnect the harness from connector CN101 on the DR-315 board.
(5) Move the DR-315 board in the direction indicated by the arrow until the capstan motor is viewed.



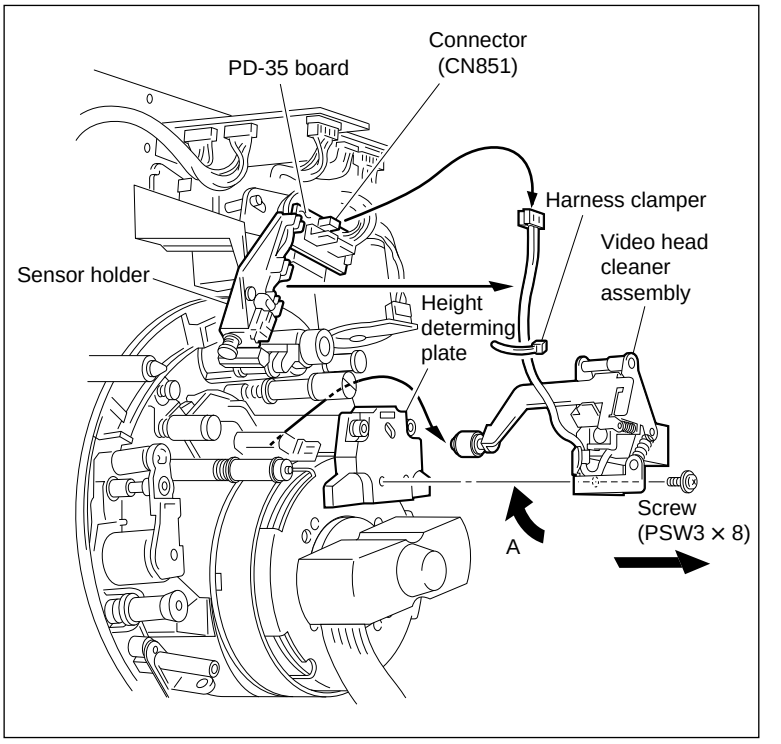
Remove the DR-315 Board

4. Remove the Video Head Cleaner Assembly

(1) Disconnect the connector from connector CN851 on the PD-35 board.
(2) Cut the harness clamper.
(3) Remove the harness from the sensor holder.
(4) Remove the screw, shift the video head cleaner assembly in the direction indicated by the arrow A, and remove it from the height determing plate.

Note

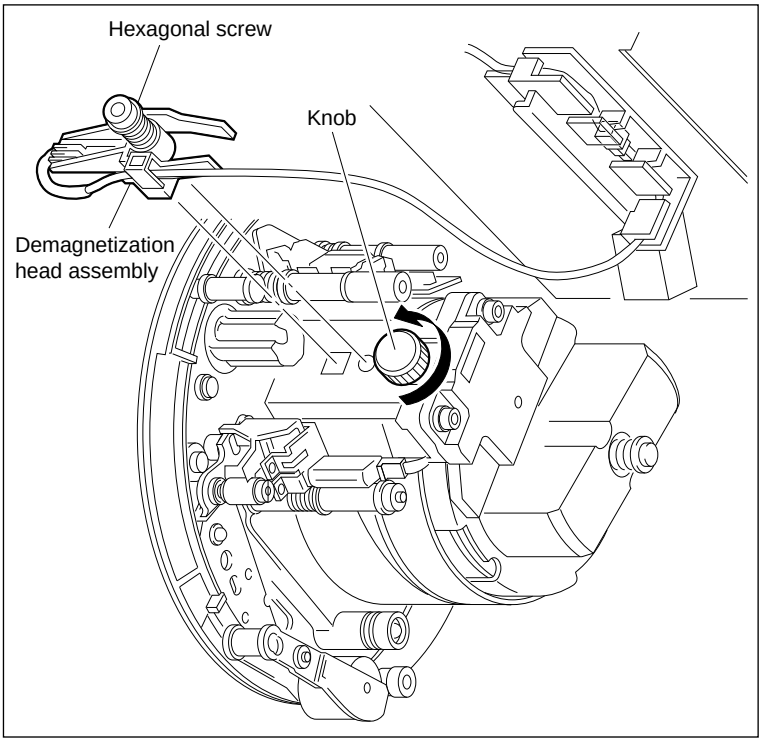
To remove the securing screws of the capstan motor, remove the video head cleaner assembly.



Remove the Video Head Cleaner Assembly

5. Remove the Demagnetization Head Assembly

(1) Turn the knob of the demagnetization head assembly counterclockwise about seven turns by finger.
(2) Loosen the hexagonal screw, then remove the demagnetization head assembly from the drum assembly.



Remove the Demagnetization Head Assembly

6. Remove the Capstan Motor

(1) Disconnect the connector on the capstan motor board.

(2) Remove the two screws while holding the capstan motor by hand.

CAUTION

Be carefull not to fall the removed screw in the unit.

Installation

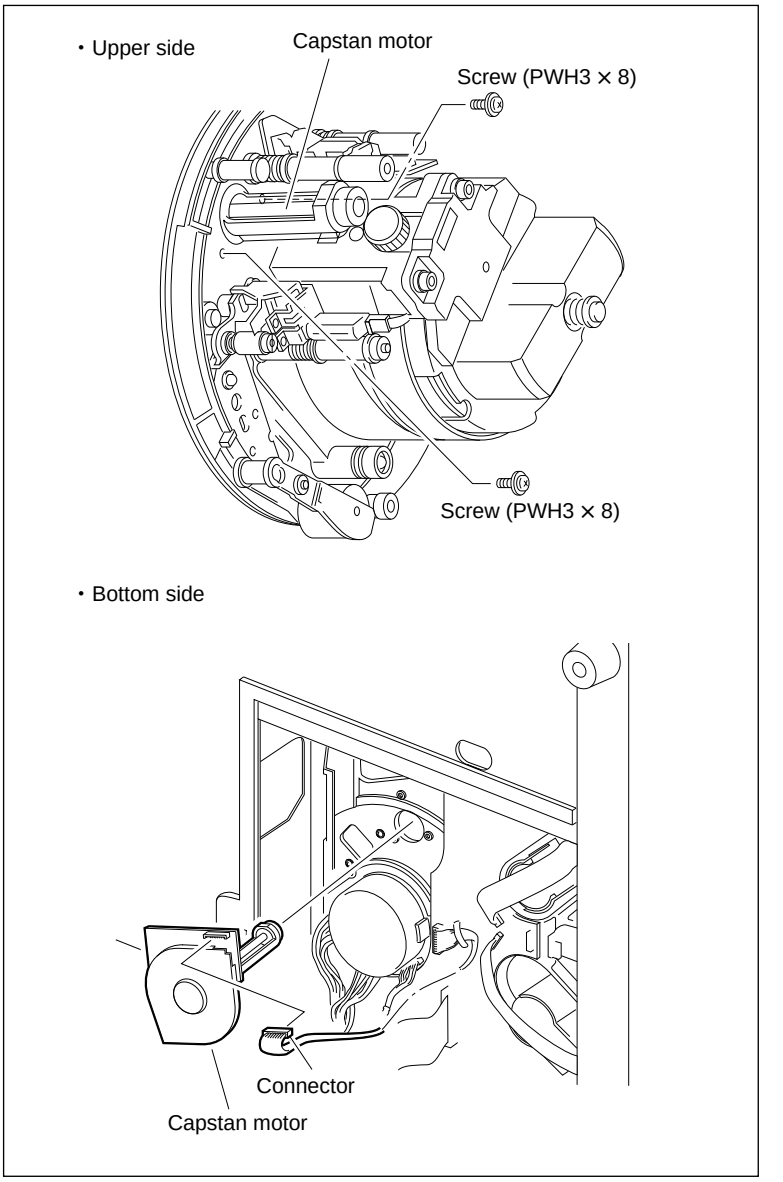
7. Install the Capstan Motor

(1) Pass a new capstan motor through the hole of the chassis in the direction shown in the figure and tighten the two screws.

CAUTION

- Be careful not to drop the capstan motor.
- Be careful not to damage the capstan motor shaft when passing the capstan motor through the hole of the chassis.

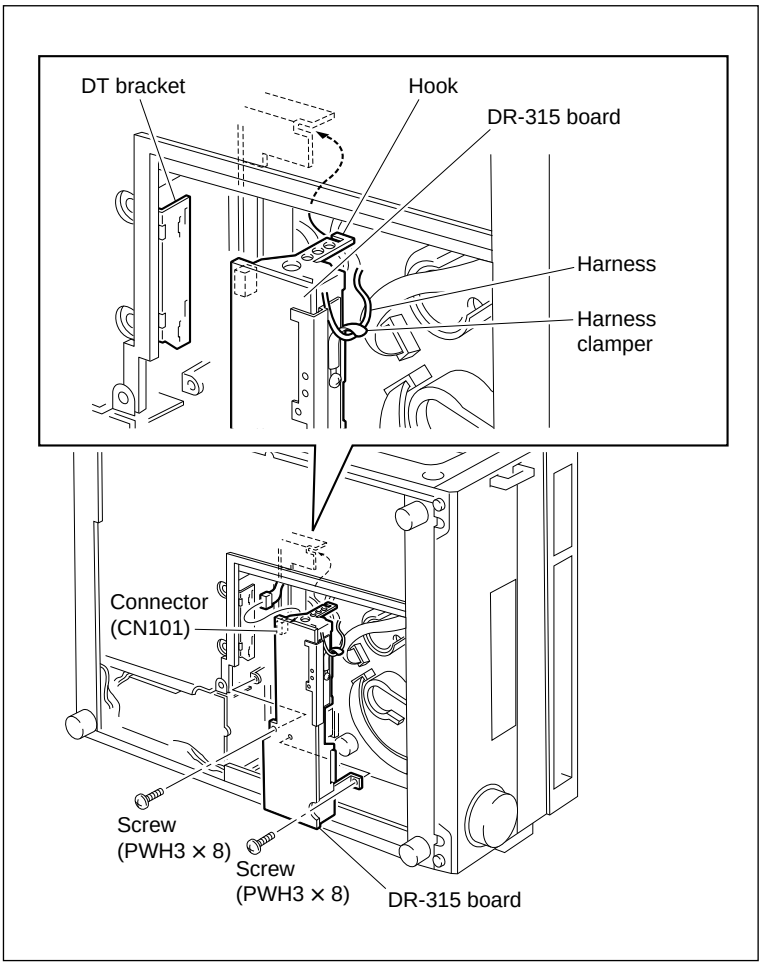
(2) Connect the connector disconnected in (1) of step 6 to the capstan motor board.



Remove/Install the Capstan Motor

8. Install the DR-315 Board

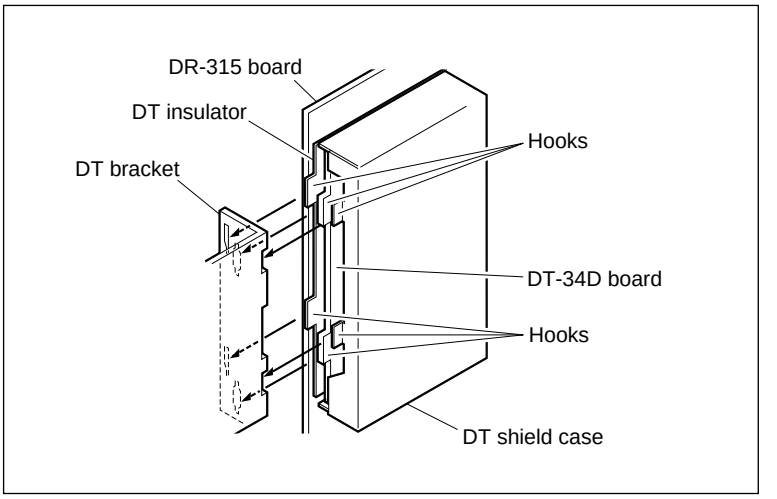
(1) Connect a connector to the connector CN101 on the DR-315 board.
(2) Put the hook on the DR-315 board into the groove of the chassis.
(3) Tighten the DR-315 board with two screws.
(4) Fix the harness released in step (1) of procedure 3 using a harness clamper.



Install the DR-315 Board

9. Install the DT-34D Board

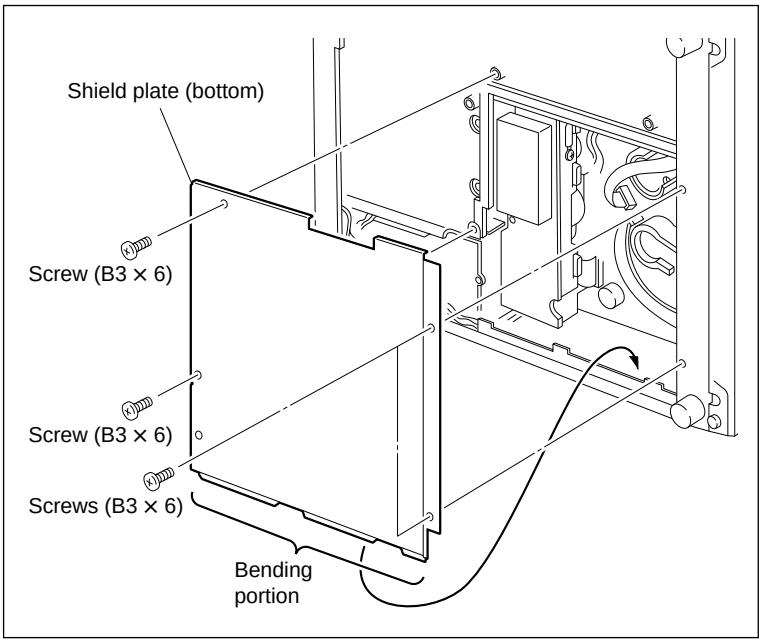
Install the DT-34D board in the reverse order of steps (1) to (3) of procedure 2.
Insert the two hooks of the DT insulator, DT-34D board, and DT shield case into the square holes of the DT bracket.



Install the DT-34D Board

10. Install the Shield Plate (Bottom)

Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

11. Install the Demagnetization Head Assembly

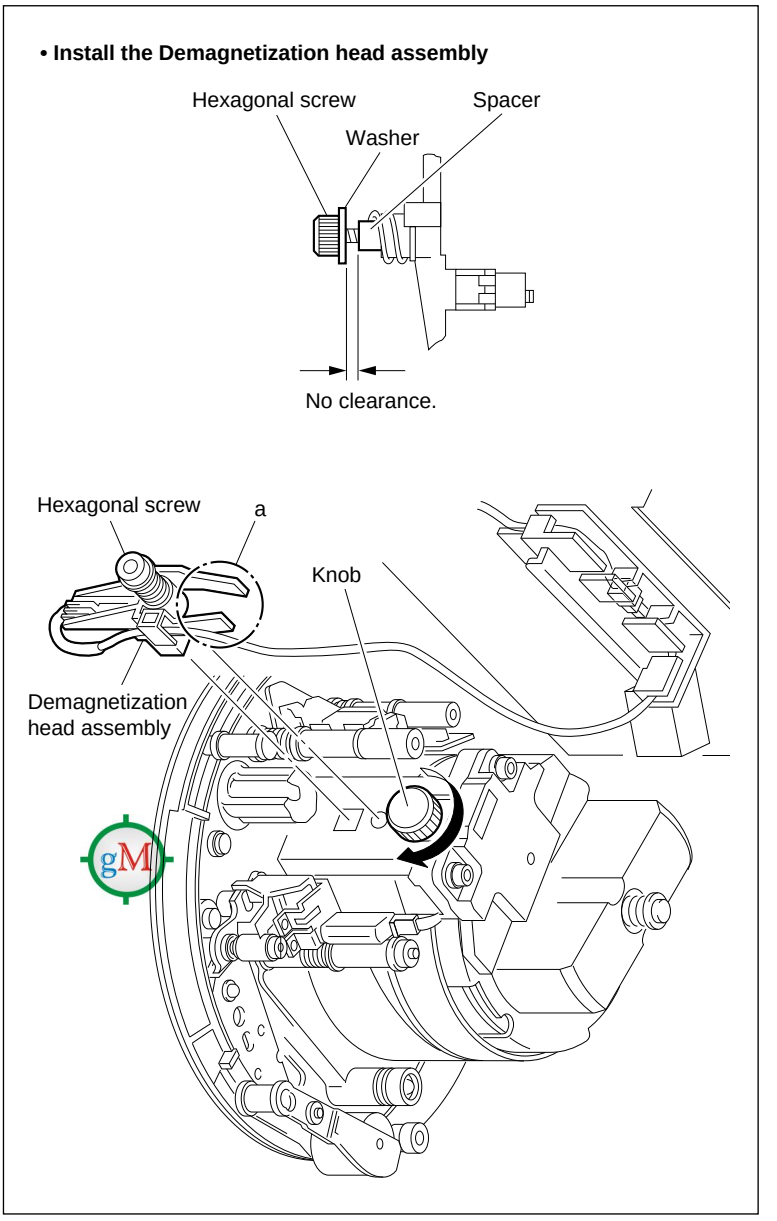
(1) Confirm that there is no clearance between the spacer and the washer of the demagnetization head assembly. (If clearance exists, tighten the hexagonal screw.)
Then insert the demagnetization head into the hole of the drum support, and tighten the hexagonal screw.

Tightening torque: 39.2×10^{-2} N•m
(4 kgf • cm)

Note

Put portion “a” of the demagnetization head assembly under the knob.

(2) Turn the knob of the demagnetization head clockwise with fingers and tighten the knob as far as it will go.



Install the Demagnetization Head Assembly

12. Install the Video Head Cleaner Assembly

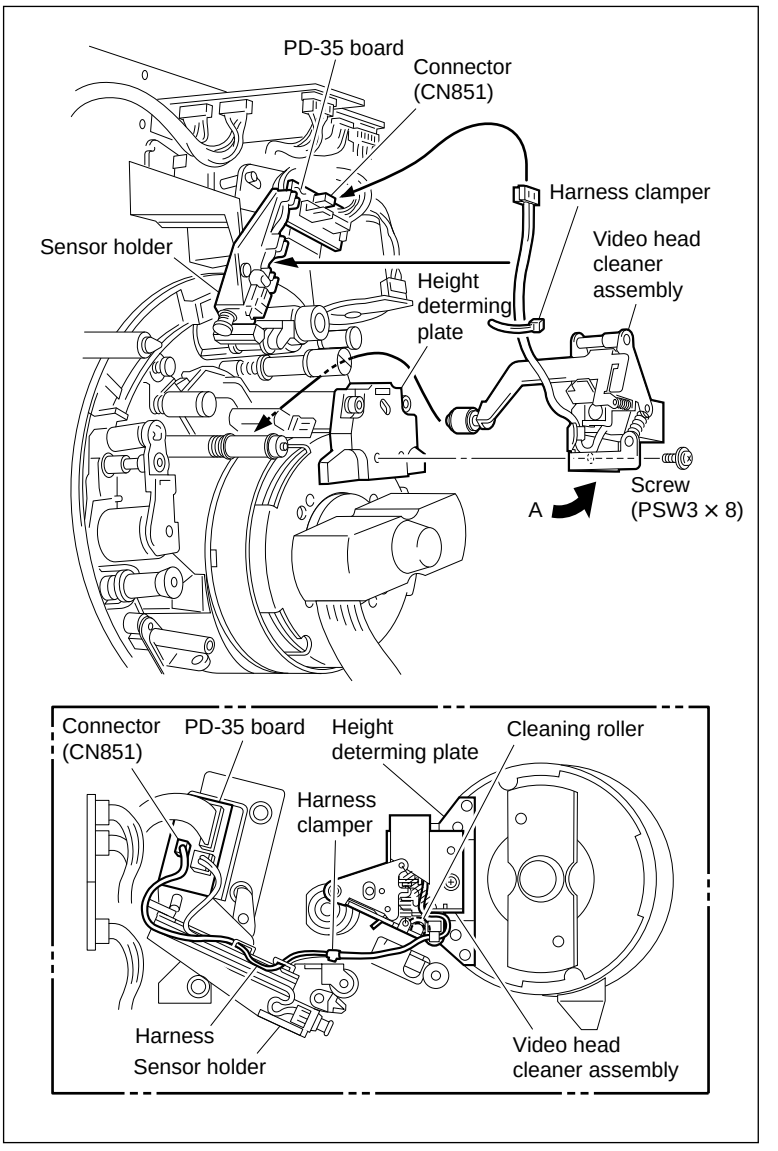
(1) Insert the cleaning roller into the clearance between the height determing plate and CTL head as shown in the figure.
(2) Adjust the position of the two pins of the video head cleaner assembly with the two holes of the height determing plate.
(3) Tighten the screw while pushing the video head cleaner assembly in the direction indicated by the arrow A.
(4) Fix the harness to the position on the sensor holder as shown in the figure.
(5) Connect the connector to connector CN851 on the PD-35 board.
(6) Bind the CTL head harness and the video head cleaner harness with the harness clamper (or the equivalent).
(7) Adjust the position of the cleaning roller. (Refer to Section 3-5, step5.)

13. Cleaning

Clean the capstan motor shaft with a cleaning cloth moistened with cleaning fluid.

CAUTION

After cleaning, wipe with a dry cleaning cloth.



Install the Video Head Cleaner Assembly

Adjustment after Replacement

14. Confirm the Pinch Press Clearance

Refer to Section 3-11-2.

15. Confirm the Tape Running

Refer to Section 4-1-2.

16. Perform the Capstan Motor Operation Check

Refer to Section 4-2 of the maintenance manual part 1. (C014: CAPSTAN MOTOR)

17. Perform the Capstan FG Duty Adjust

Refer to Section 4-2 of the maintenance manual part 1. (A003: CAPSTAN FG DUTY)

18. Perform the Capstan Free Speed Adjust

Refer to Section 4-2 of the maintenance manual part 1. (A010: CAPSTAN SPEED)

19. Perform the Adjusted Data Save

Refer to Section Section 4-2 of the maintenance manual part 1. (A012: NV-RAM CONTROL)

3-13. Reel Table Assembly Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Install the Reel Table Assembly

Adjustment after replacement

3. Confirm the Reel Table Height (Refer to Section 3-13-1.)
4. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
5. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
6. Confirm the Reel Rotation Sensor Position (Refer to Section 3-13-4.)
7. Reel FG Duty Adjustment (Refer to Section 4-2 of the maintenance manual part 1.)
   (A001: S REEL FG DUTY/A002: T REEL FG DUTY)

Note

The reel table assembly replacement is the same on the supply (S) and take-up (T) sides.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

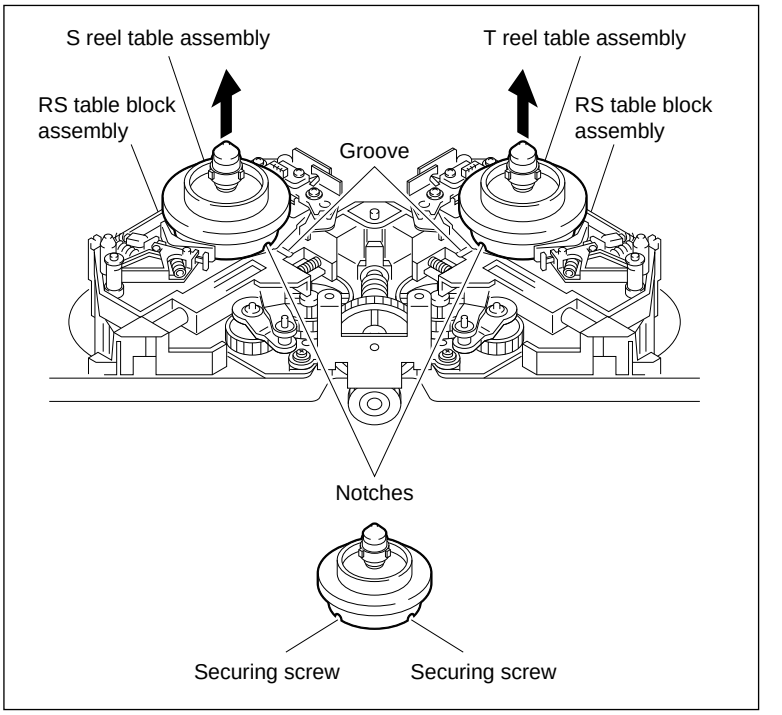
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Reel Table Assembly Removal

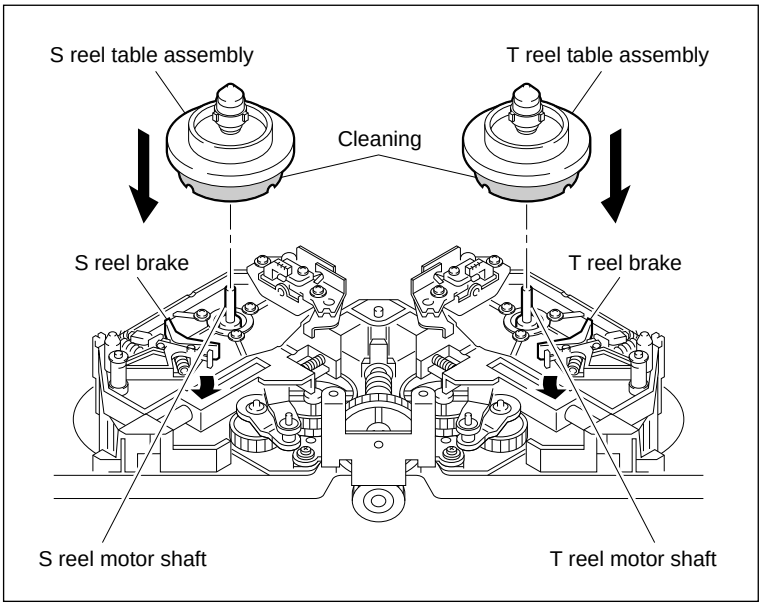
Installation

2. Install the Reel Table Assembly

(1) Clean the circumference of a new reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Reel Table Assembly Installation

Adjustment after Replacement

3. Confirm the Reel Table Height

Refer to Section 3-13-1.

4. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

5. Confirm the Reel Brake Release Amount

Refer to Section 3-13-3.

6. Confirm the Reel Rotation Sensor Position

Refer to Section 3-13-4.

7. Reel FG Duty Adjustment

Refer to Section 4-2 of the maintenance manual part 1.
(A001: S REEL FG DUTY/
A002: T REEL FG DUTY)

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3-13-1. Reel Table Height Adjustment

Notes

- Be sure to check the height of the reel table when a reel table is removed or when it is replaced.
- Perform the reel table height adjustment correctly.
  The height of the reel table is used as the reference for the tape path.
- After the supply reel table height adjustment is performed, be sure to check the video tracking. (Refer to Section 4-1-3.)

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel table height gauge (MW-935) : J-6329-350-A
- L-shaped wrench (1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the RS Table Block Assembly in the L Cassette Position

Rotate the drive gear counterclockwise as far as it will go.

3. Check the Take-up Reel Table Height

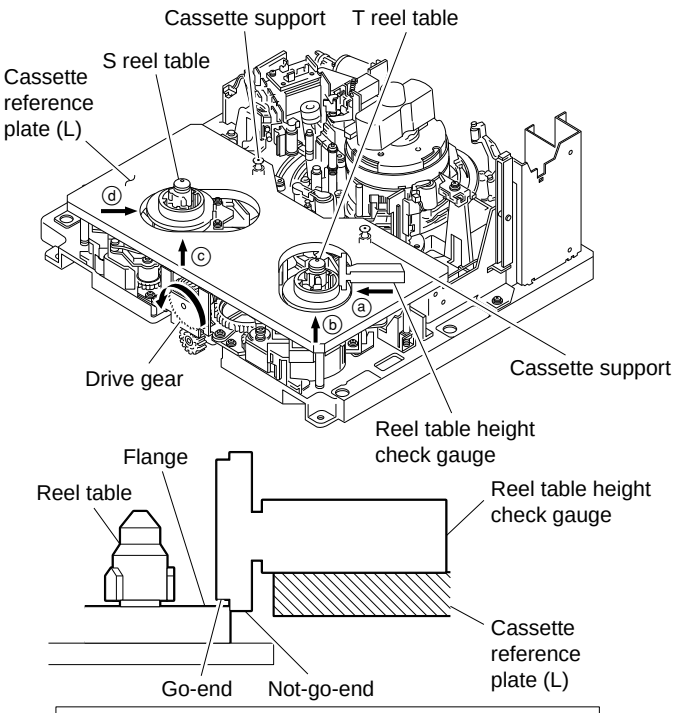
(1) Press the “T”-stamped side of the gauge against the take-up reel table from the direction indicated by the arrow ⓐ.
(2) Check that the specification is satisfied while rotating the take-up reel table clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓑ in the same way.

4. Check the Supply Reel Table Height

(1) Press the “S”-stamped side of the gauge against the supply reel table from the direction indicated by the arrow ⓒ.
(2) Check that the specification is satisfied while rotating the supply reel table counter-clockwise by one turn.
(3) Check the reel table height from the directions indicated by the arrow ⓓ in the same way.

If the specification is not satisfied in steps 3 and 4, perform steps 7 and 8.

< L cassette position >



Spec. : The go-end of the gauge slide over the flange of the reel table.
The not-go-end of the gauge does not slide over.

Check the Reel Table Height (L)

5. Place the Reel Shift Plate Assembly in the S Cassette Position

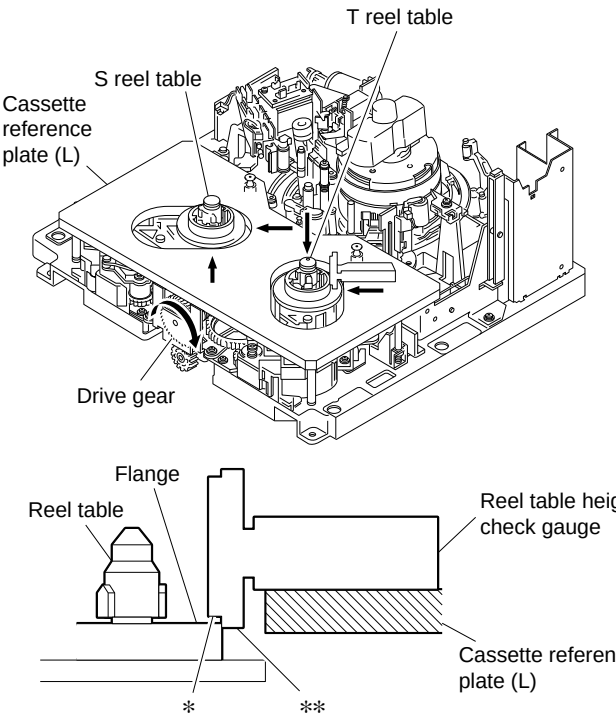
Rotate the drive gear clockwise as far as it will go.

6. Check the Supply and Take-up Reel Table Height

Perform in the same way as in steps 3 and 4.

If the specification is not satisfied, perform steps 7 and later.
If the specifications are satisfied in both the L and S cassette positions, perform steps 9 and later.

< S cassette position >



Spec. : The * marked portion of the gauge slide over the flange of the reel table.
The ** marked portion of the gauge does not slide over.

Check the Reel Table Height (S)

Adjustment

7. Remove the Reel Table

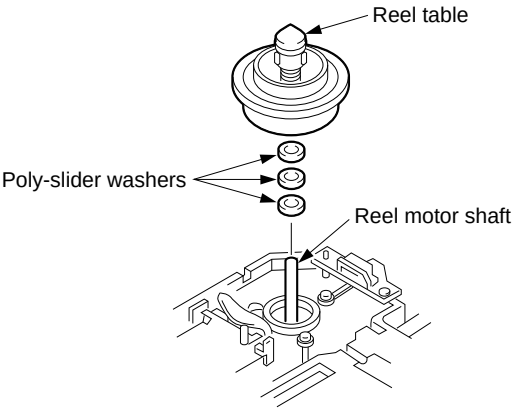
Refer to step 1 in Section 3-13.

8. Adjust the Number of Poly-slider Washers

Adjust the number of poly-slider washers installed in the reel motor shaft so that the specifications are satisfied in both the L and S cassette positions.

9. Remove the Cassette Reference Plate (L)

Remove the cassette reference plate (L) and reel table height gauge.



・Poly-slider washer for adjustment

Diameter	Thickness	Part No.
4 mm	0.05 mm	3-188-108-01
	0.13 mm	3-701-441-01
	0.25 mm	3-701-441-11
	0.5 mm	3-701-441-21

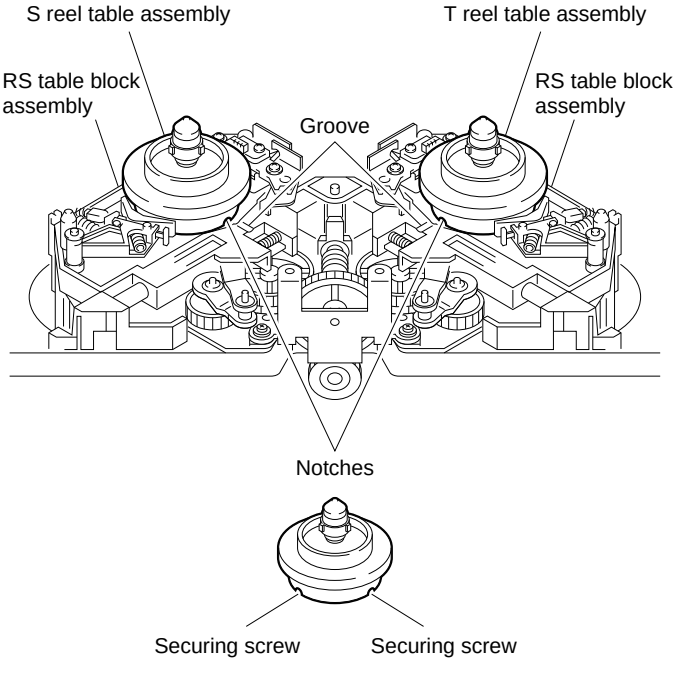
Remove the Reel Table

10. Tighten the Screws of the Reel Table Assembly

(1) Align the notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert an L-shaped wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly and tighten the two screws.

11. Recheck the Reel Table Height

Refer to steps 2 through 6.



Tighten the Screws of the Reel Table Assembly

3-13-2. Reel Brake Clearance Check

Note

- Be sure to check clearance of the reel brake when the reel table assembly is removed or when it is replaced.

Check

1. Check the Take-up Reel Brake Clearance

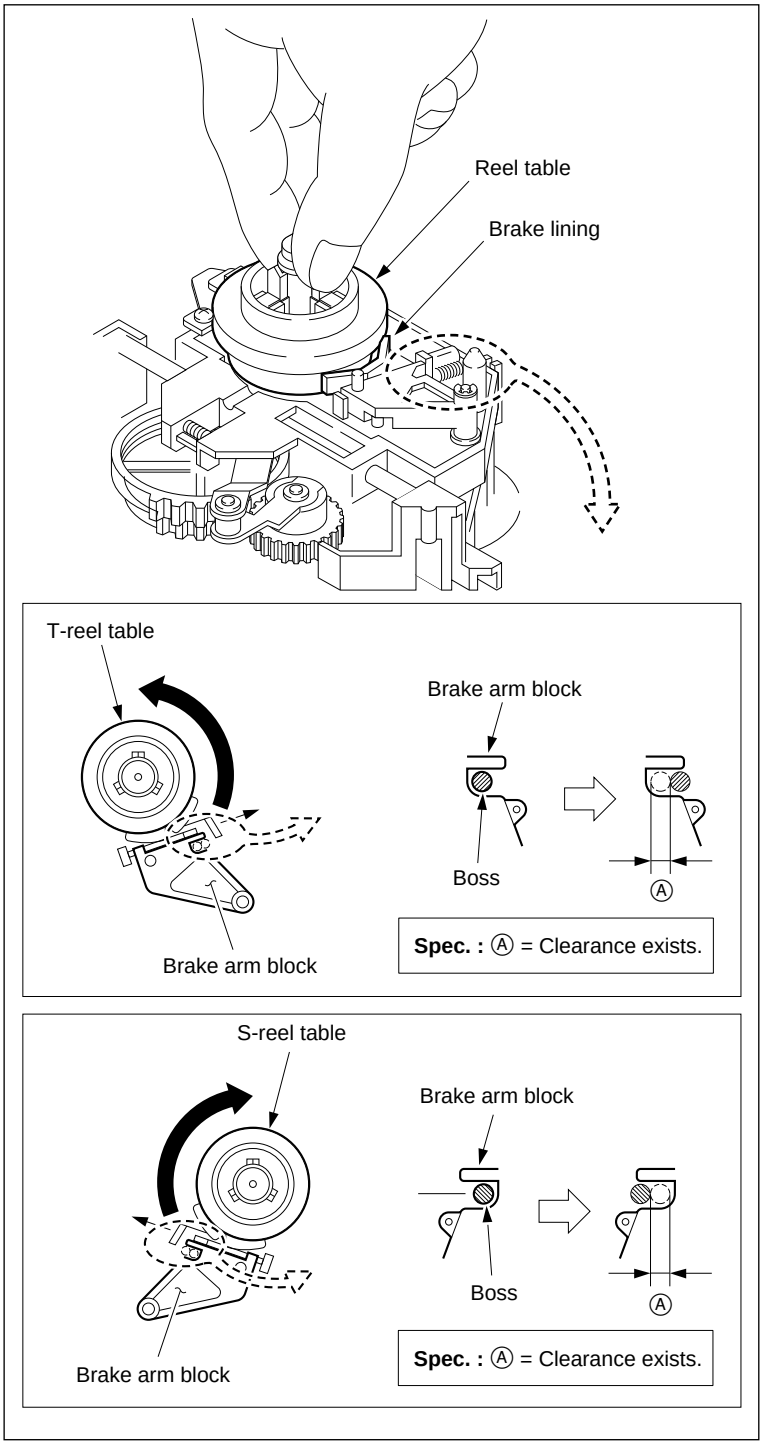
Rotate the take-up reel table counterclockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 3-14.

2. Check the Supply Reel Brake Clearance

Rotate the supply reel table clockwise by fingers.
At that time, check that a clearance occurs between the brake arm block and boss.

If no clearance occurs, replace the brake lining.
Brake Lining Replacement : Section 3-14.



Check the Reel Brake Clearance

3-13-3. Reel Brake Release Amount Adjustment

Notes

- Be sure to check the release amount of the reel brake when the reel table assembly is removed or when it is replaced.
- Be sure to check the following when performing adjustment with the specification not satisfied.
  (1) Cassette pillar height check (Refer to Section 3-15-3.)
  (2) Reel table height check (Refer to Section 3-13-1)

Basic knowledge

The brake lining is pressed against the reel table when the power is off.
When the power is turned on, the brake lining is released and away from the reel table.
In the PLAY, STOP, REW, F. FWD, SEARCH and REV modes, the brake lining remains released.
Press the EJECT button to put the unit into the EJECT mode. The brake lining is pressed against the reel table a few seconds after the EJECT mode is completed.

Tool

- Wire clearance check gauge set: J-6152-450-A

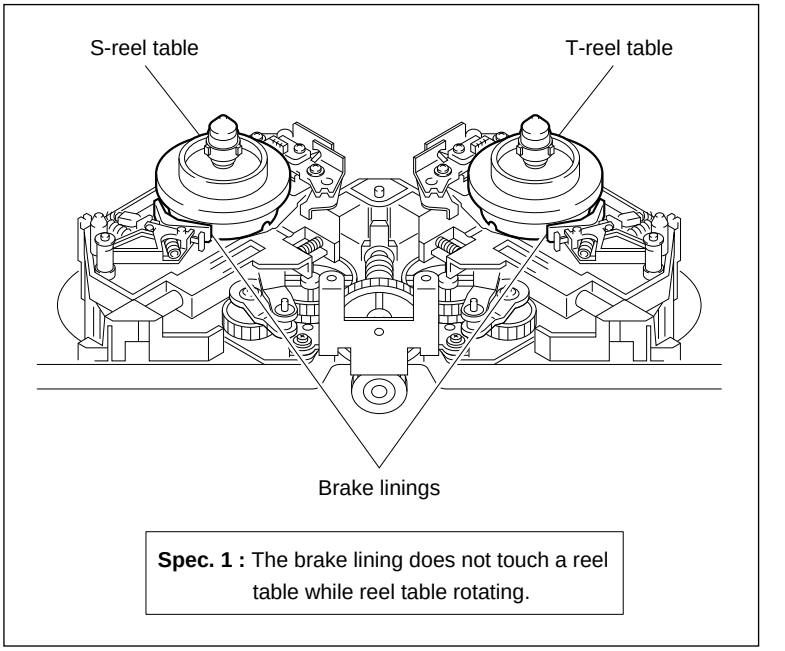
Check

1. Turn the Power On

2. Check the Brake Release Amount

Check on the supply and take-up sides that the brake lining does not touch the reel table while a reel table is rotating. (Specification 1)

If specification 1 is not satisfied, perform steps 3 and later.



Check the Reel Brake Release Amount

Adjustment

3. Turn the Power Off

4. Remove the RS Table Block Assembly
Refer to steps 1 through 3 in Section 3-15-1.
(It is not necessary to remove a reel table.)

5. Loosen the Screws Fixing the Brake Solenoid
Loosen the two screws fixing the brake solenoid.

6. Adjust the Brake Solenoid Position
Press down the iron core of the brake solenoid to the energized position.
At that time, adjust the brake solenoid position so that the clearance between the brake lining and reel table satisfies specification 2.

Note

Press down only the iron core by a sharp-pointed stick. Do no touch other portions.

Know-how:
- Shift the brake solenoid upward.
  →Clearance A is narrowed.
- Shift the brake solenoid downward.
  →Clearance A is widened.

7. Tighten the Screws Fixing the Brake Solenoid
Tighten the two screws loosened in step 5.

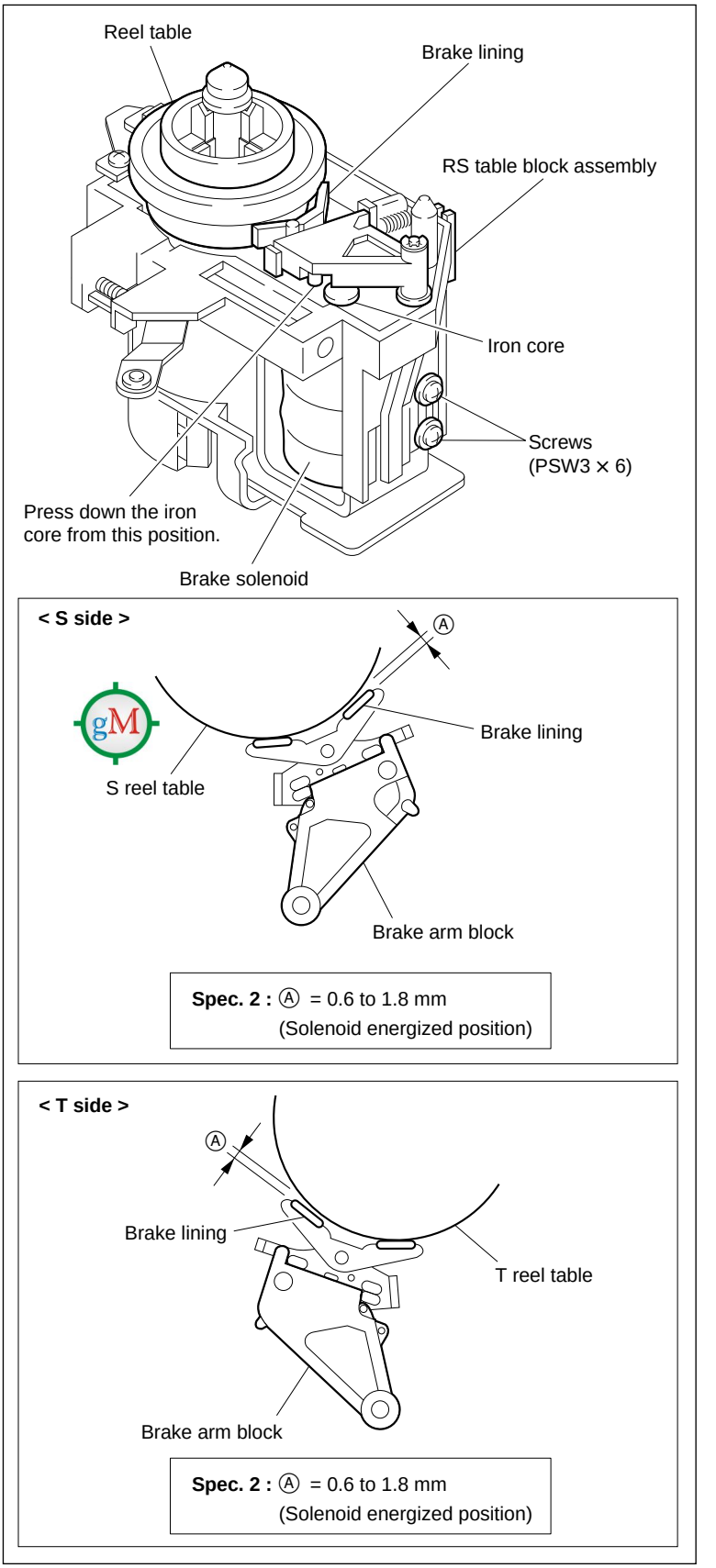
Tightening torque : 98×10^{-2} N•m
(10.0 kgf • cm)

8. Recheck the Brake Release Amount
Refer to step 6.

9. Install the RS Table Block Assembly
Refer to steps 9 through 13 in Section 3-15-1.
(It is not necessary to smear grease again to the slide shaft or to apply oil again to the crank arm (A).)

10. Check the Cassette Pillar Height
Refer to Section 3-15-3.

11. Check the Reel Table Height
Refer to Section 3-13-1.



Check the Reel Brake Release Amount

3-13-4. Reel Table Rotation Sensor Position Adjustment

Note

- Be sure to check the position of the reel table rotation sensor when a reel motor assembly or reel table is replaced.

Tools

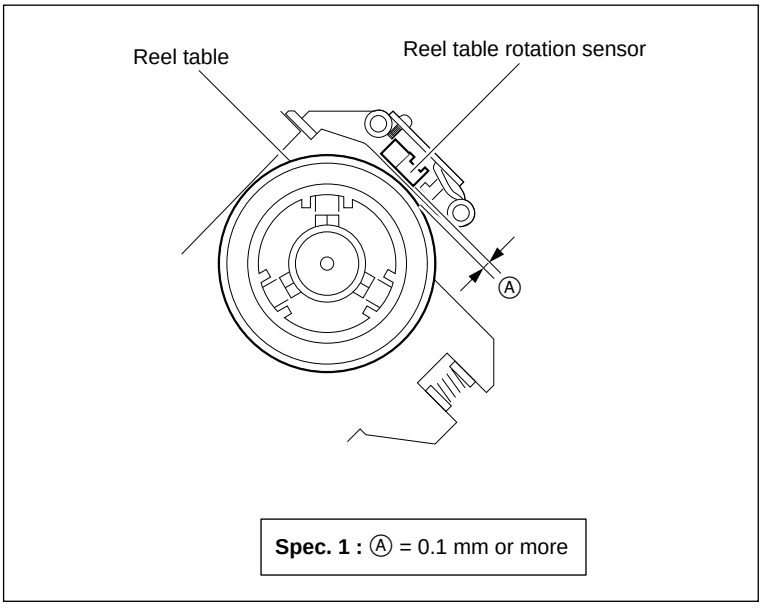
- Thickness gauge : 9-911-053-00
- Torque screwdriver (6 k•cm) (JB-5251) : J-6252-510-A
- Betacam cassette tape

Check

1. Check the Reel Table Rotation Sensor Clearance

Check that the clearance between the reel table and the reel table rotation sensor satisfies the specification 1.

If the specification 1 is not satisfied, perform steps 4 and later.



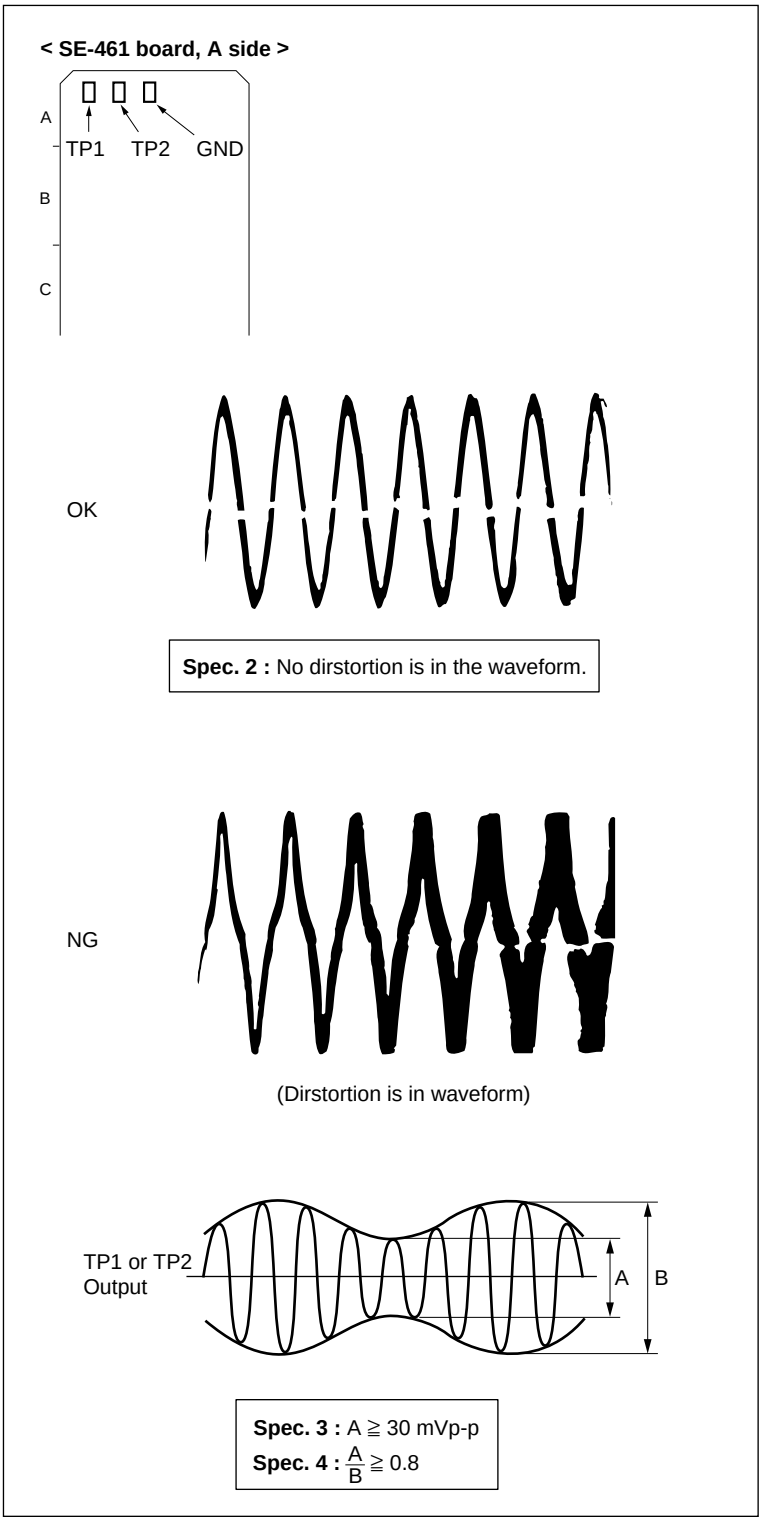
Check the Reel Table Rotation Sensor Clearance

2. Connect the Oscilloscope

CH-1: TP1/SE-461 board (S-FG signal)
CH-2: TP2/SE-461 board (T-FG signal)

3. Check the Reel FG Output Level

(1) Turn the power on.
(2) Put the EJECT mode by putting the EJECT button.
(3) Insert the cassette tape.
(4) Put the unit into the PLAY mode, then check the outputs of CH-1 and CH-2 satisfy the specification 2.
(5) Eject the cassette tape by putting the EJECT button.
(6) Put the unit into the STOP mode in a state of without the cassette tape in the unit by putting the STOP button.
(7) In the Step (6), check that the outputs of CH-1 and CH-2 satify specifications 3 and 4.



Check the Reel FG Output Level

Adjustment

4. Loosen the Screws

Loosen the two screws by 1/4 to 1/2 turn.

5. Adjust the Reel Table Rotation Sensor Position

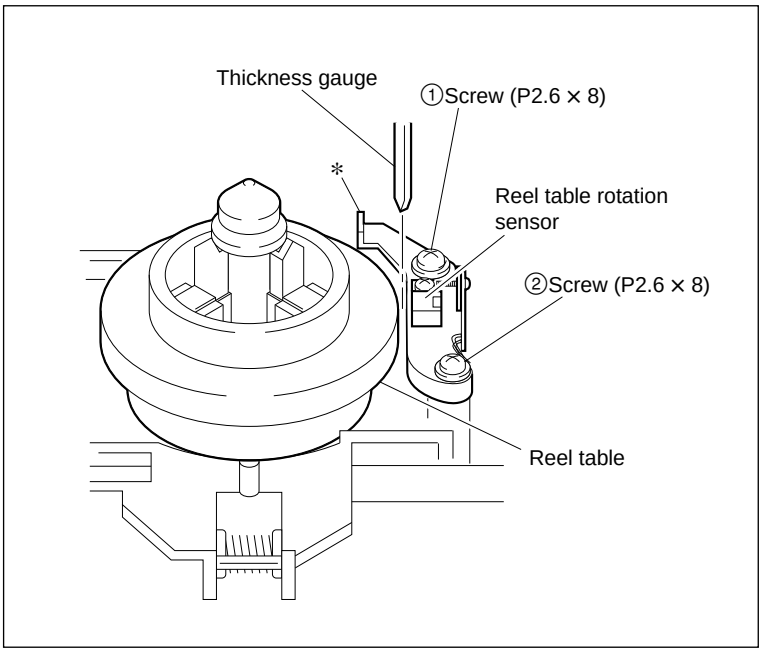
(1) Put the unit into the STOP mode in a state of without cassette tape by putting the STOP button.

(2) Adjust the position of the reel table rotation sensor so that the distortion is not in the waveform, and maximize.

- Adjustment method
  Grasp the portion "✻" with the finger, and adjust the sensor to move in the direction of the left and right.

(3) Tighten the two screws loosen in step 4 in oder of ① and ② while keeping the state of the step (2).

Tightening torque: 49×10^{-2} N•m
(5 kgf • cm)



Adjust the Reel Table Rotation Sensor Position

6. Recheck the Reel Table Rotation Sensor Position

(1) Insert the thickness gauge (t=0.1 mm) between the reel table rotation sensor and the reel table.

CAUTION

Be careful not to damage the reel flange and the reel table rotation sensor.

(2) Rotate the reel table, and check that it rotates smoothly.

(3) Recheck that the specifications 1 through 4 are satisfied referring to steps 1 through 3.

3-14. Brake Lining Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Brake Assembly
3. Remove the Brake Lining
4. Install the Brake Lining
5. Install the Brake Assembly
6. Install the Reel Table Assembly

Adjustment after Replacement

7. Confirm the Reel Table Height (Refer to Section 3-13-1.)
8. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
9. Confirm the Reel Brake Release (Refer to Section 3-13-3.)

Notes

- The brake lining replacement is the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake lining is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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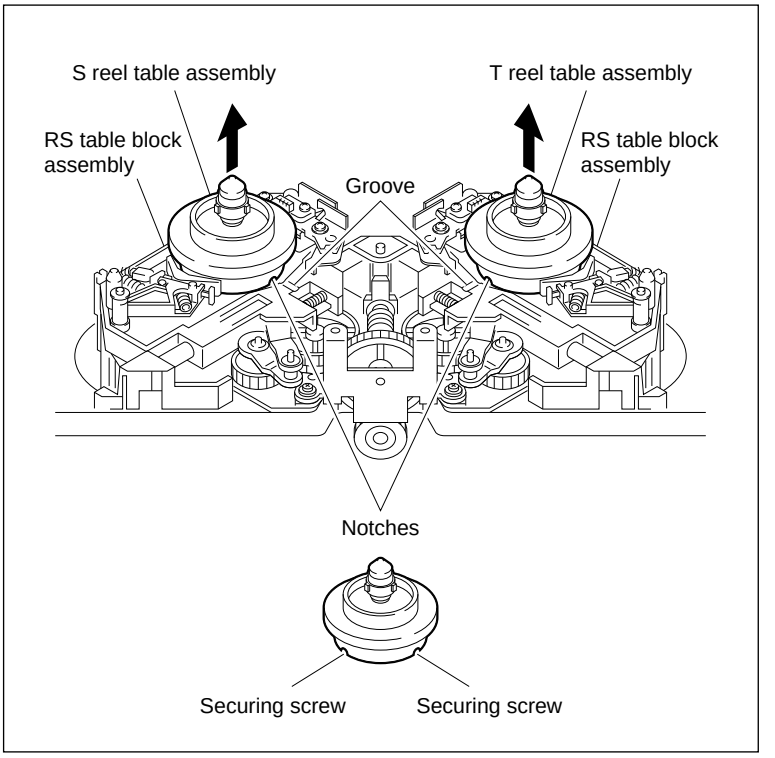
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Turn the screw counterclockwise by 1/2 to one turn, then loosen.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the reel shift plate assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

2. Remove the Brake Assembly

(1) Remove the spring put on the RS table block assembly.
(2) Remove the E ring, then remove the brake assembly.

3. Remove the Brake Lining

Remove the spring put on the brake arm block, then remove the brake lining.

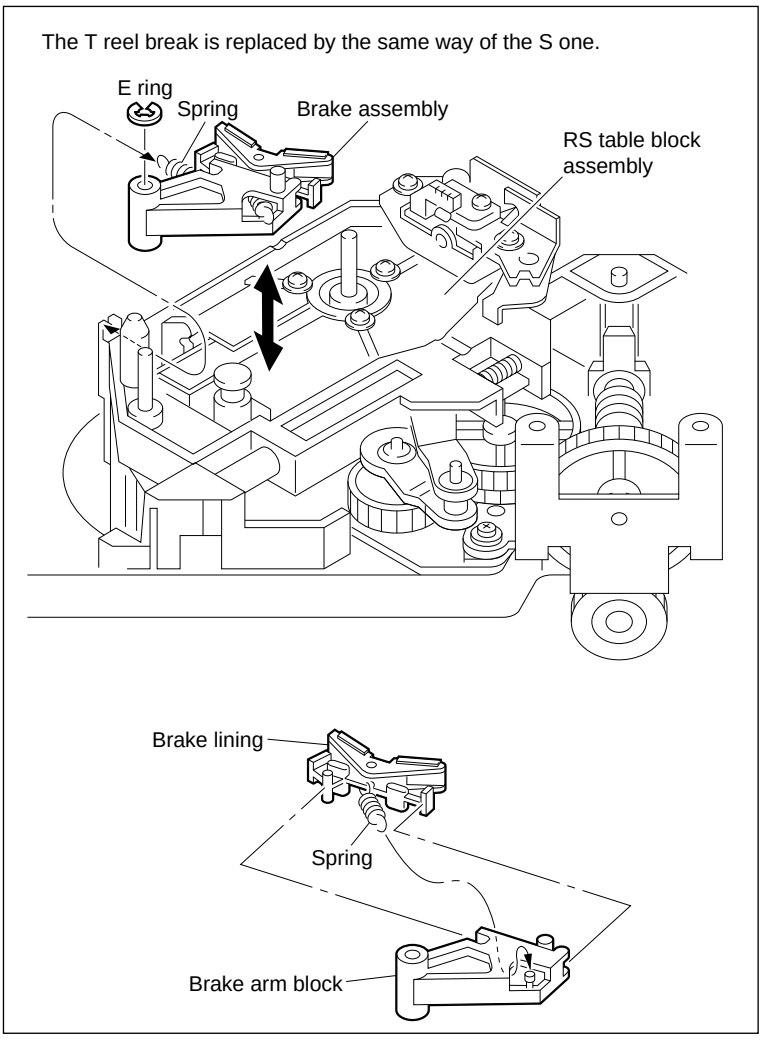
Installation

4. Install the Brake Lining

(1) Combine a new brake lining and brake arm block as shown in the figure.
(2) Hook the spring on the brake arm block.

5. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the RS table block assembly.
(2) Hook the spring on the RS table block assembly.
(3) Install the brake assembly using a new E ring.



Remove/Install the Brake Lining

6. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two screws of the reel table assembly after reel table height adjustment.

Adjustment after Replacement

7. Confirm the Reel Table Height

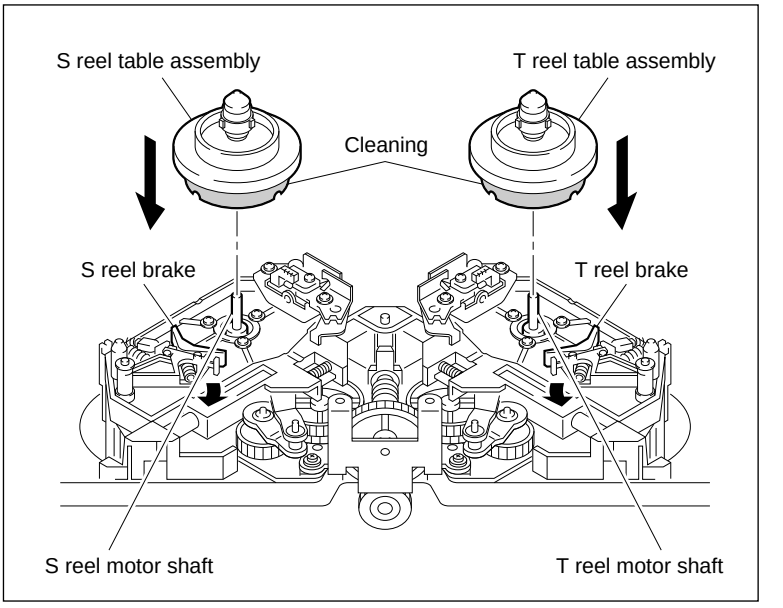
Refer to Section 3-13-1.

8. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

9. Confirm the Reel Brake Release

Refer to Section 3-13-3.



Install the Reel Table Assembly

3-15. Reel Motor Assembly Replacement

Replace the reel motor assembly every 4,000 hours of tape running.

3-15-1. Replacement Procedure of the Reel Motor Assembly

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Holder
3. Remove the RS Table Block Assembly
4. Disconnect the Connectors
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
5. Remove the Reel Motor Assembly
6. Cleaning
7. Install the Reel Motor Assembly
8. Connect the Connectors
   (S side: CN926 and 927/RM Board, T side: CN926 and 927/RM Board)
9. Connect the Flat Cable
   (S side: CN923/RM Board, T side: CN923/RM Board)
10. Install the Slide Shaft
11. Install the RS Table Block Assembly
12. Smear Grease to the Slide Shaft
13. Install the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness (Refer to Section 3-15-2.)
15. Install the Reel Table Assembly
16. Confirm the Cassette Pillar Height (Refer to Section 3-15-3.)
17. Confirm the Reel Table Height (Refer to Section 3-13-1.)
18. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
19. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
20. Perform the Rell Table Rotation Sensor Position Adjustment
    (Refer to Section 3-13-4.)
21. Perform the Reel Motor Operation Check
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C010: S REEL MOTOR/C011: T REEL MOTOR)
22. Perform the Reel FG Duty Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A001: S REEL FG DUTY/A002: T REEL FG DUTY)
23. Perform the Reel Motor Offset/Friction Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A004: S REEL OFFSET/FRIC/A005: T REEL OFFSET/FRIC)
24. Perform the Reel Torque Adjust
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A006: S REEL TORQUE/A007: T REEL TORQUE)
25. Perform the Adjustmented Data Save
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (A012: NV-RAM CONTROL)

Note

The parts consisting reel motor is different between S side and T side. However, how to replace the reel motor assembly is the same for both sides.

Preparation

1. Turn the power off.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L-shaped wrench (1.5 mm) : 7-700-736-05
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver+s bit (+ 3 mm, l = 90 mm) : J-6323-430-A
- Grease (SGL-601) : 7-651-000-10
- Oil : 7-661-018-18
- Cleaning cloth : 3-184-527-01
- Cleaning fluid : 9-919-573-01

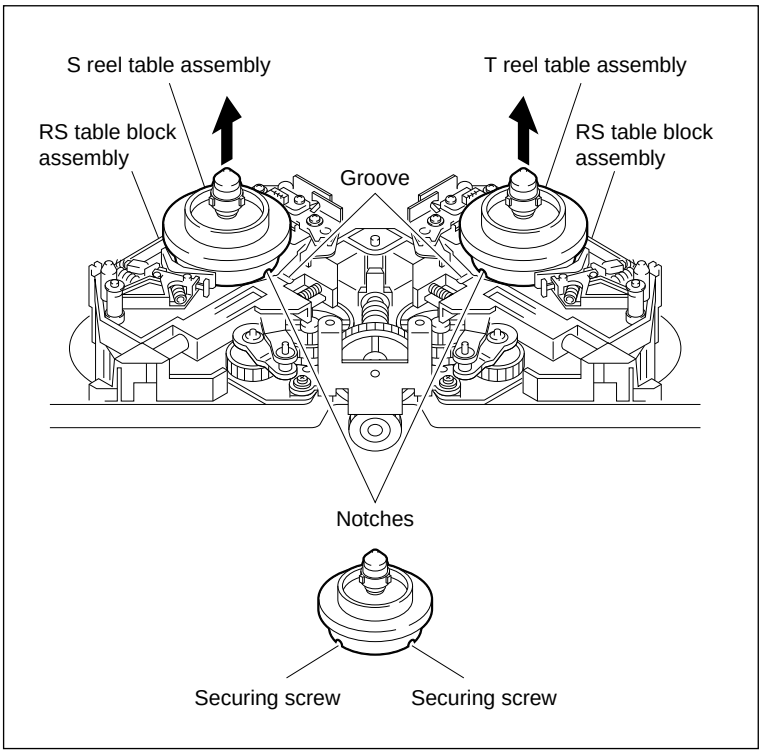
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove of the RS table block assembly.
(2) Insert the L-shaped wrench into the notch of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the screw.
(4) Align another notch of the reel table assembly with the groove of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

CAUTION

When the reel table assembly is removed, a poly-slider washer may adhere to it. In this case, remove it from the reel table assembly and return it to the reel motor shaft position.
This poly-slider washer is used for reel table height adjustment.



Remove the Reel Table Assembly

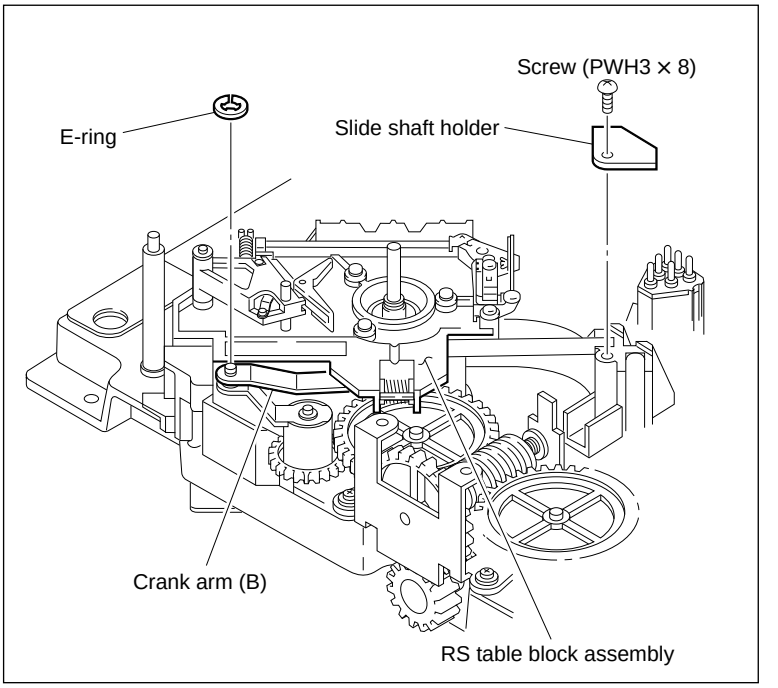
2. Remove the Crank Arm and Slide Shaft Holder

(1) Place the RS table block assembly in the intermediate position of S and L cassettes.

Note

The RS table block assembly assembly cannot be removed in the S cassette position or T cassette position.

(2) Remove an E ring and remove the crank arm (B).
(3) Remove the screw and remove the slide shaft holder.



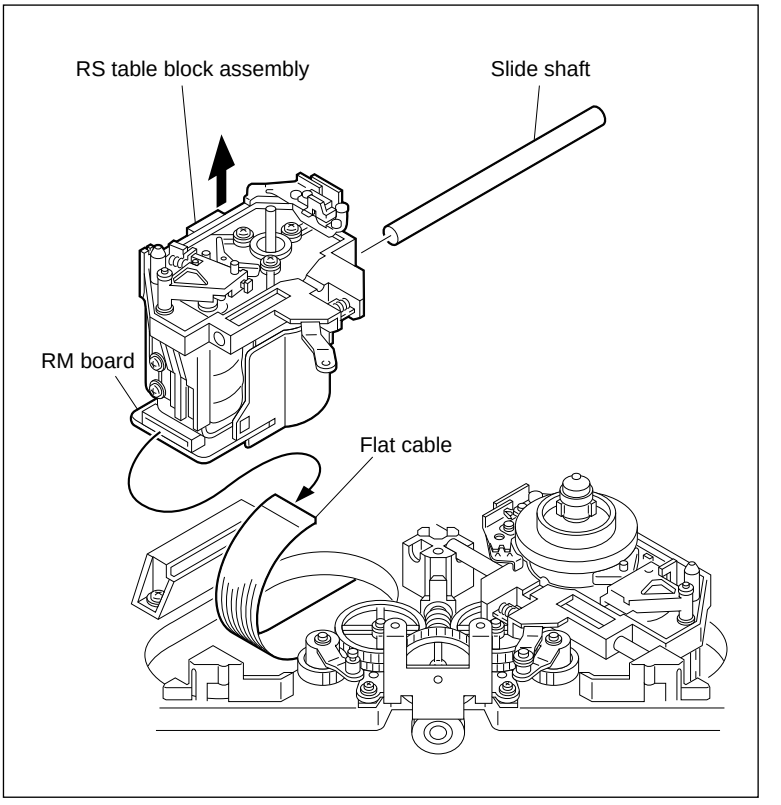
Remove the Crank Arm and Slide Shaft Holder

3. Remove the RS Table Block Assembly

(1) While pulling out the slide shaft and remove the RS table block assembly.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease that is adhering to the holes (two) pulled out the slide shaft on the RS table block assembly using a cloth.
(4) Wipe the grease that is adhering on the surface of the slide shaft using a cloth.

CAUTION

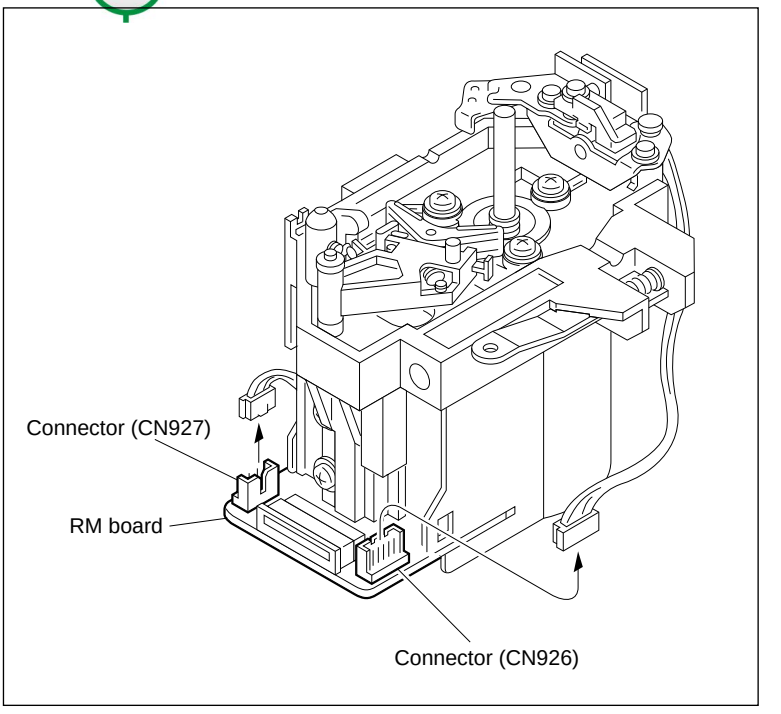
- Be careful not to adhere grease smeared the slide shaft to another parts.
- Be careful not to cause damage to the slide shaft during removal.



Remove the RS Table Block Assembly

4. Disconnect the Connectors

Disconnect the harness from the two connectors CN926 and CN927 on the RM board.



Disconnect the Connectors

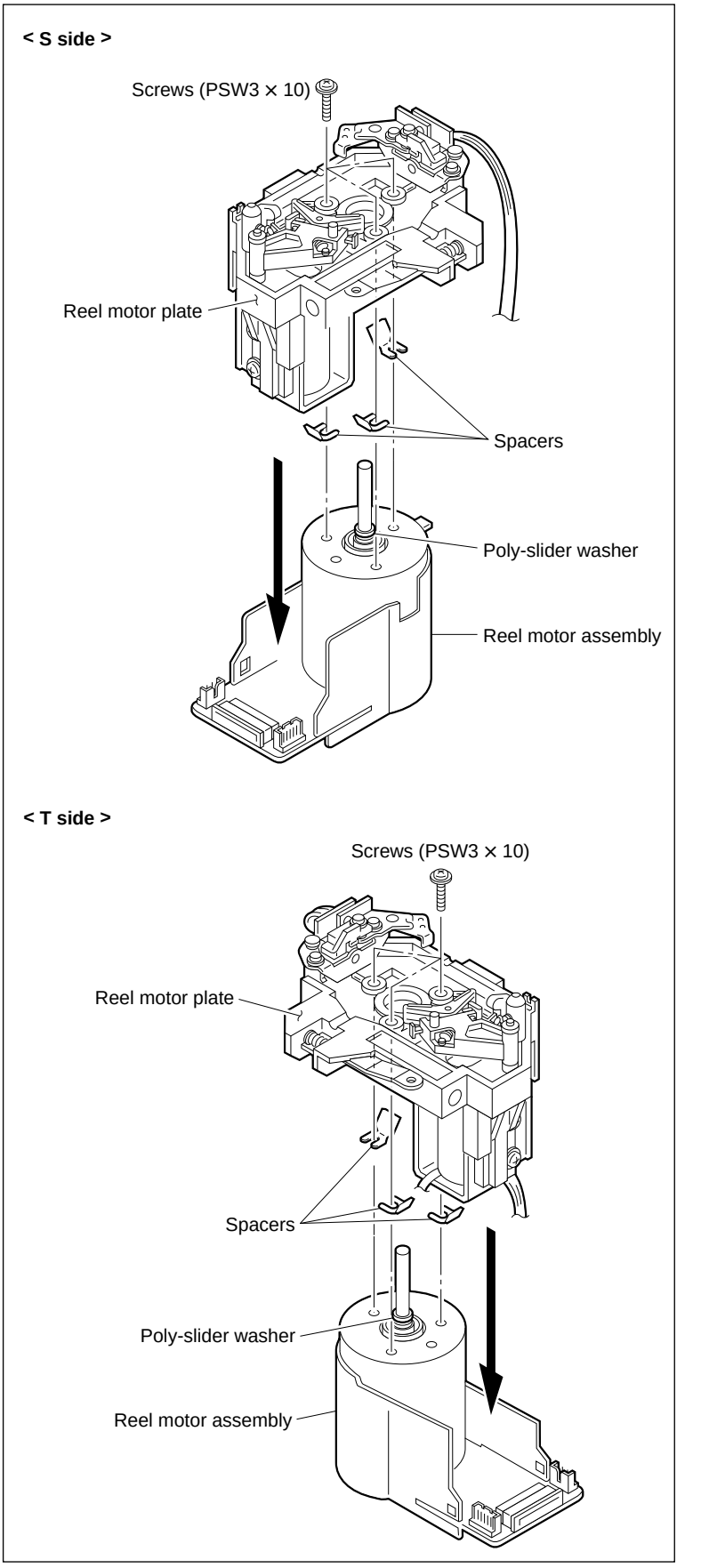
5. Remove the Reel Motor Assembly

(1) Remove the three screws and remove the reel motor assembly.

CAUTION

The spacer(s) is inserted between the reel motor and the reel motor plate. Be careful not to lose spacer(s) since it comes off with the reel motor assembly.

(2) Remove the poly-slider washer from the reel motor shaft.
Be careful not to loose the removed poly-slider washer.



Remove the Reel Motor Assembly

Installation

6. Cleaning

Clean the reel motor assembly mounting surface and reel motor plate mounting surface.

7. Install the Reel Motor Assembly

(1) Pass the reel motor assembly through the hole of the reel motor plate as in the direction shown in the figure.

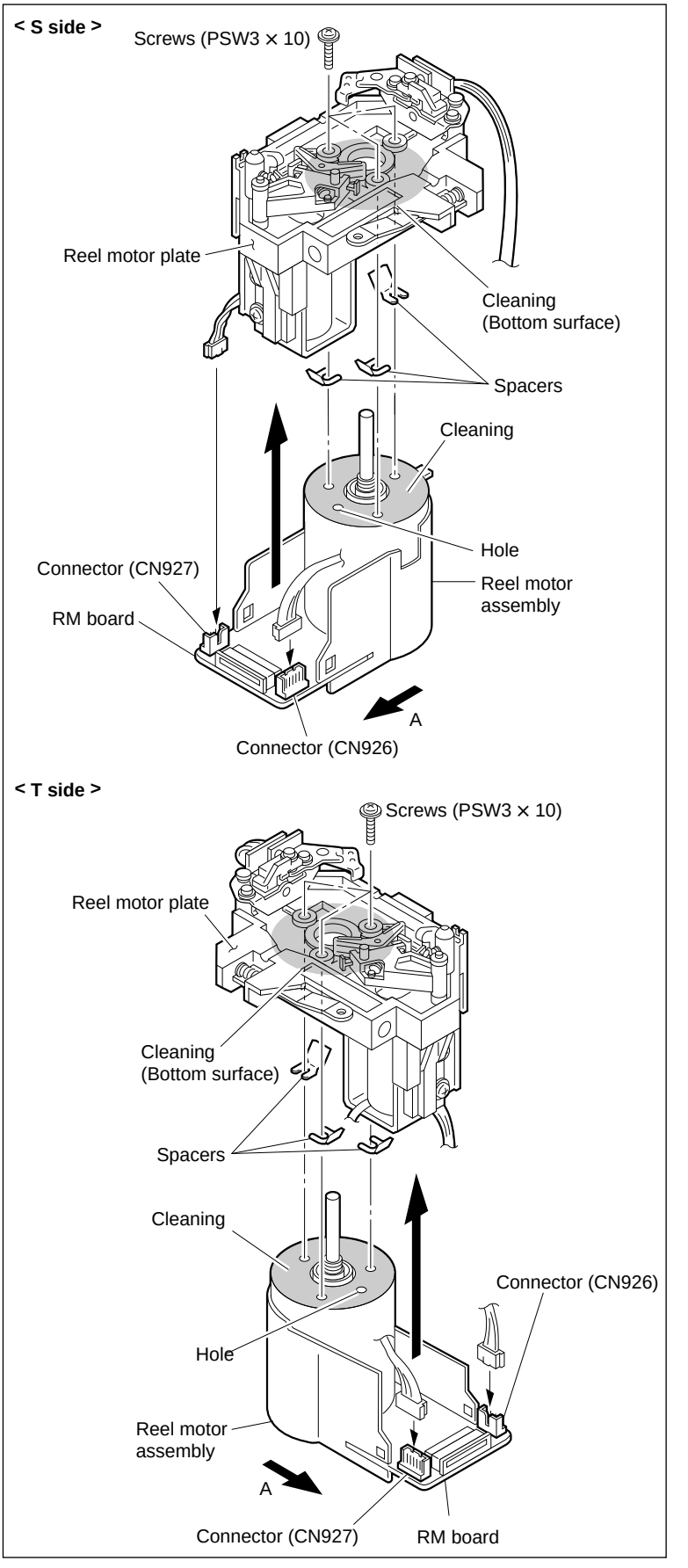
(2) Tighten the three screws gradually while moving the reel motor assembly in the direction indicated by the arrow A.

Tightening torque: 68.6×10^{-2} N•m
(7 kgf • cm)

(3) Pass the poly-slider washer removed in (2) of step 5 through the reel motor shaft.

8. Connect the Connectors

Connect the harness to the two connectors CN926 and CN927 on the RM board.



Install the Reel Motor Assembly

Install the Slide Shaft

9. Connect the Flat Cable

(1) Clean the insertion of the flat cable with a dry cleaning cloth.
(2) Connect the flat cable disconnected in step 3 into the connector on the RM board, then lock.

CAUTION

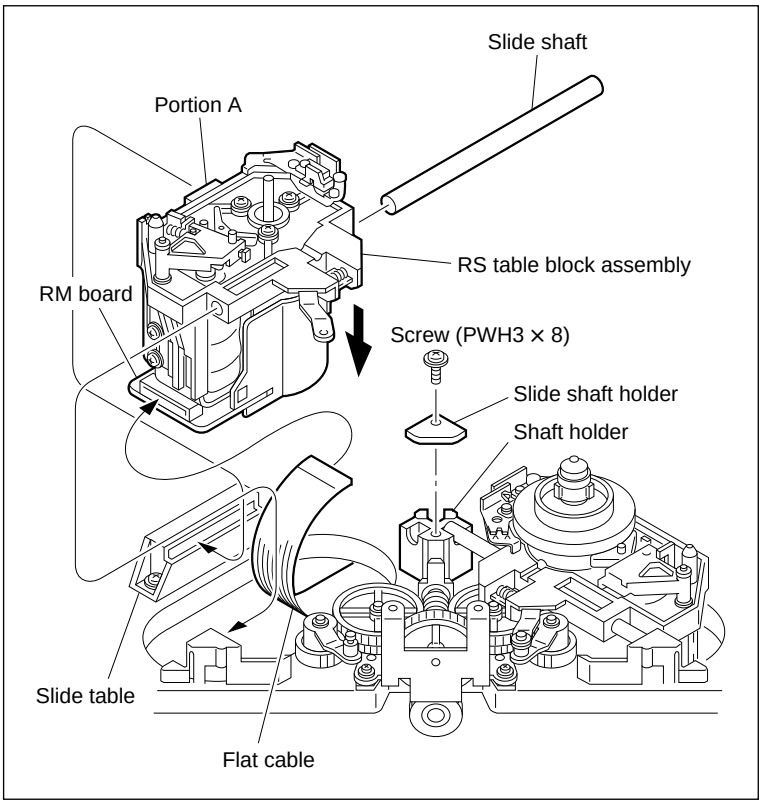
- Connect the flat cable with its conductor side (printing surface) upside.
- Be careful not to twist the flat cable when connecting it.

10. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

11. Install the RS Table Block Assembly

(1) Put the slide shaft on the shaft holder while inserting the portion A shown in the figure of the RS table block assembly into the slide table.
(2) Install the slide shaft holder.



Install the Slide Shaft

12. Smear Grease to the Slide Shaft

(1) Smear grease very lightly to the slide shaft.

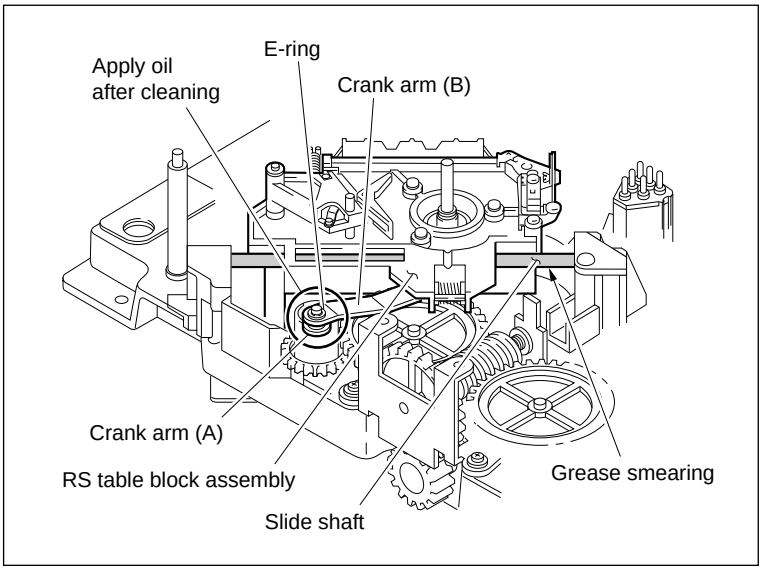
Note

Be careful that the grease does not adhere to ther parts.

(2) Confirm that the RS table block assembly moves smoothly when moving it by hand towards S cassette and L cassette positions.

13. Install the Crank Arm

(1) Clean the shaft of the crank arm (A), then pour a drop of oil on it.
(2) Confirm that the RS table block assembly is in the intermediate position of S and L cassettes.
(3) Install the crank arm (B) to the shaft of the crank arm (A) with an E ring.



Install the Crank Arm

Adjustment after Replacement

14. Confirm the Reel Motor Shaft Slantness

Refer to Section 3-15-2.

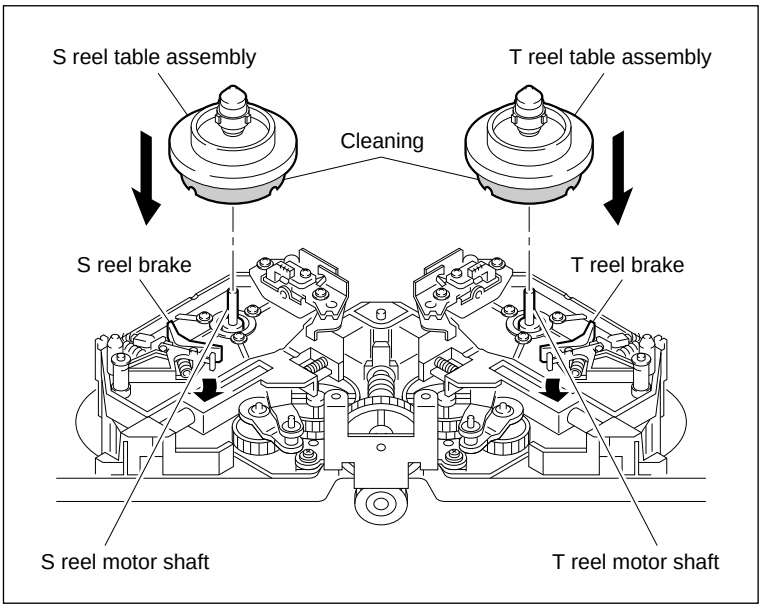
15. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.

(2) Pass the reel table assembly through the reel motor shaft while moving the reel brake in the direction indicated by the arrow.

CAUTION

Tighten two securing screws after the reel table height adjustment is complated.



Install the Reel Table Assembly

16. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

17. Confirm the Reel Table Height

Refer to Section 3-13-1.

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18. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

19. Confirm the Reel Brake Release Amount

Refer to Section 3-13-3.

20. Reform the Reel Table Rotation Sensor Position Adjustment

Refer to Section 3-13-4.

21. Perform the Reel Motor Operation Check

Refer to Section 4-2 of the maintenance manual part 1.
(C010: S REEL MOTOR/
C011: T REEL MOTOR)

22. Perform the Reel FG Duty Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A001: S REEL FG DUTY/
A002: T REEL FG DUTY)

23. Perform the Reel Offset/Friction Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A004: S REEL OFFSET/FRIC/
A005: T REEL OFFSET/FRIC)

24. Perform the Reel Torque Adjust

Refer to Section 4-2 of the maintenance manual part 1.
(A006: S REEL TORQUE/A007: T REEL TORQUE)

25. Perform the Adjustmented Data Save

Refer to Section 4-2 of the maintenance manual part 1.
(A012: NV-RAM CONTROL)

3-15-2. Reel Motor Shaft Slantness Adjustment

Notes

- Be sure to check the slantness of the reel motor shaft when the reel motor assembly is removed or when the RS table block assembly is removed.
- Perform the reel motor shaft slantness adjustment correctly.
  If this adjustment is not performed correctly, a reel hub touches the case in a cassette tape, a noise occurs, and the tape does not run correctly. This may damage the tape.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Reel motor shaft slantness check tool (MW-087) : J-6320-870-A
- Thickness gauge : 9-911-053-00
- Torque screwdriver (12 kg•cm) (JB-5252) : J-6252-520-A
- Torque screwdriver+s bit (+3 mm, l=50 mm) : J-6323-430-A

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette supports.

2. Place the Reel Shift Plate Assembly in the L Cassette Position

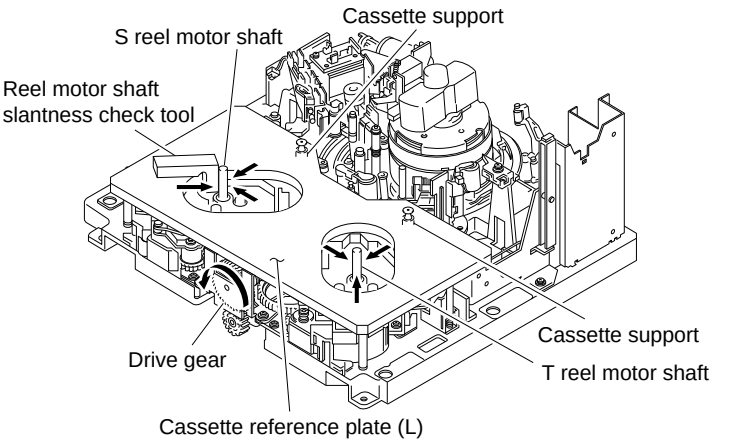
Rotate the drive gear counterclockwise as far as it will go.

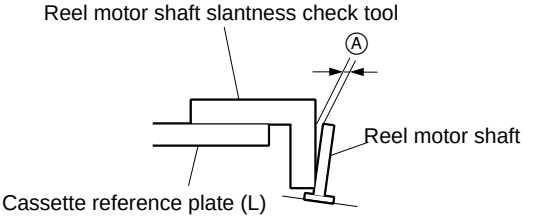
3. Check the Slantness in the L Cassette Position

(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.
(2) Check that the clearance between the reel motor shaft and tool satisfies specification 1.

If the specification is not satisfied, perform steps 6 through 10.

< L cassette position >





Spec.1 : (L cassette position)
A ≦ 0.03 mm

Check the Reel Motor Shaft Slantness (L)

4. Place the Reel Shift Plate Assembly in the S Cassette Position

Rotate the drive gear clockwise as far as it will go.

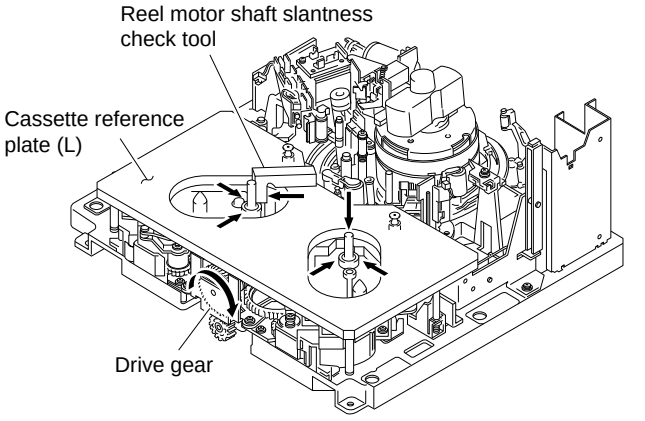
5. Check the Slantness in the S Cassette Position

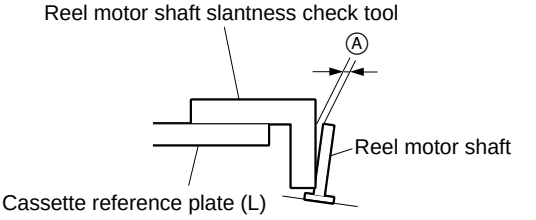
(1) Press the check tool against the reel motor shaft from the directions indicated by the arrow.

(2) Check that the clearance between the reel motor shaft and tool satisfies specification 2.

If the specification is not satisfied, perform steps 6 and later.

< S cassette position >





Spec. 2 : (S cassette position)
A ≦ 0.1 mm

Check the Reel Motor Shaft Slantness (S)

Adjustment

6. Loosen Screws

Loosen the three screws fixing the reel motor by one to two turns.

7. Bend Spacer

Bend the adjustment spacer as shown in the figure.

8. Insert Spacer

Insert the adjustment spacer into the square hole on the upper surface of the reel motor plate with tweezers.

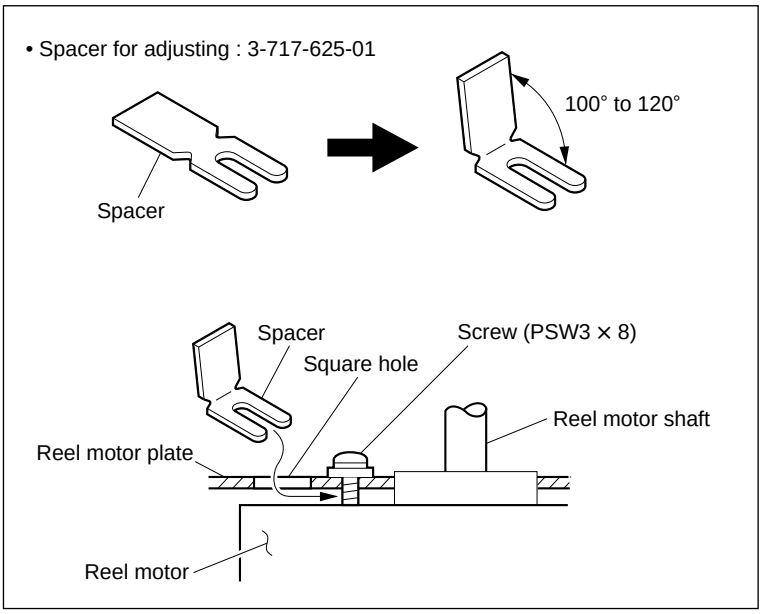
9. Tighten Screws

Gradually tighten the three screws loosened in step 6.

Tightening torque: 68.6×10^{-2} N•m (7 kgf • cm)

10. Recheck the Reel Motor Shaft Slantness

Refer to steps 2 through 5.



Ajustment the Reel Motor Shaft Slantness

3-15-3. Cassette Pillar Height Adjustment

Note

- Be sure to check the height of the cassette pillars when the reel shift plate assembly is removed.

Tools

- Cassette reference plate (L) (MW-088) : J-6320-880-A
- Small dental mirror (circular) : J-6080-029-A
- L-shaped wrench (1.5 mm) : 7-700-736-05

Check

1. Install the Cassette Reference Plate (L)

Place the cassette reference plate (L) in the direction shown in the figure, then place it on two cassette pillars.

2. Place the Reel Shift Plate Assembly in the Intermediate Position of S and L Cassettes

(1) Rotate the drive gear and place the reel shift plate assembly in the intermediate position of S and L cassettes.

Note

The reel shift plate assembly should be moved to the position where the cassette pillars do not appear from the hole of the cassette reference plate (L).

(2) Check that the S and T cassette pillars are positioned under the cassette reference plate (L).

3. Check the Cassette Pillar Height

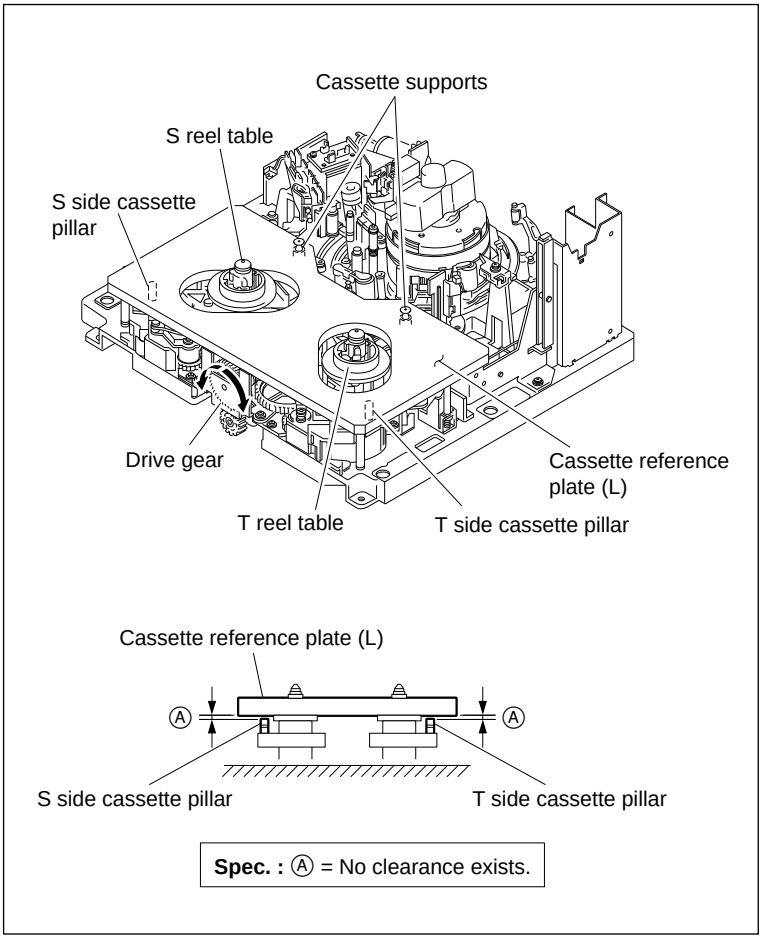
(1) Turn the casstte reference plate (L) over and place it on the cassette pillars.

Note

The reference plate should be turned over because it has a concave portion at the back of the cassette reference plate (L) and cannot be adjusted correctly.

(2) Check with a small dental mirror that there are no clearances between the S and T cassette pillars and the reference plate (L).

If the specification is not satisfied, perform steps 4 through 6.



Check the Cassette Pillar Height

Adjustment

4. Loosen the Securing Screw

Loosen the securing screw of the S or T cassette pillar by one to two turns.

5. Adjust the Cassette Pillar Height

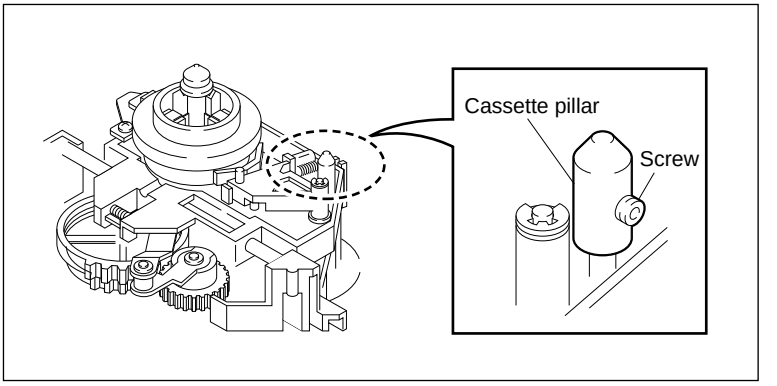
Lift the cassette pillar and press it slightly against the lower surface of the cassette reference plate (L).
Tighten the securing screw under this condition.

6. Recheck the Cassette Pillar Height

Check that the height of the S and T cassette pillars satisfy the specification.

CAUTION

Shift the tightening position of the fixing screw when performing readjustment with the specification not satisfied. (Do not tighten the screw in the same position as previous.)



Adjust the Cassette Pillar Height

3-16. Brake Solenoid Replacement

Outline

Replacement

1. Remove the Reel Table Assembly
2. Remove the Crank Arm and Slide Shaft Support
3. Remove the RS Table Block Assembly
4. Disconnect the Harness (CN926 and CN927/RM Board)
5. Remove the Reel Motor Assembly
6. Remove the Brake Assembly
7. Remove the Brake Solenoid
8. Install the Brake Solenoid
9. Install the Brake Assembly
10. Cleaning (Reel Motor Assembly)
11. Install the Reel Motor Assembly
12. Connect the Harness (CN926 and CN927/RM Board)
13. Connect the Flat Cable
14. Install the Slide Shaft
15. Install the RS Table Block Assembly
16. Applying Grease to Slide Shaft
17. Install the Crank Arm

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness (Refer to Section 3-15-2.)
19. Install the Reel Table Assembly
20. Confirm the Cassette Pillar Height (Refer to Section 3-15-3.)
21. Confirm the Reel Table Height (Refer to Section 3-13-1.)
22. Confirm the Reel Brake Clearance (Refer to Section 3-13-2.)
23. Confirm the Reel Brake Release Amount (Refer to Section 3-13-3.)
24. Confirm the Brake Solenoid Operation
    (Refer to Section 4-2 of the maintenance manual part 1.)
    (C021: S REEL BRAKE/C022: T REEL BRAKE)

Notes

- The brake solenoid replacement and its adjustment after replacement are the same on the supply (S) and take-up (T) sides.
- Use a new E ring when the brake solenoid is replaced.
  E ring (2.3): 7-624-105-04

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (d = 1.5 mm): 7-700-736-05
- Torque screwdriver (12 kg • cm)(JB-5252): J-6252-520-A
- Torque screwdriver bit (+3 mm, l = 90 mm): J-6323-430-A
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

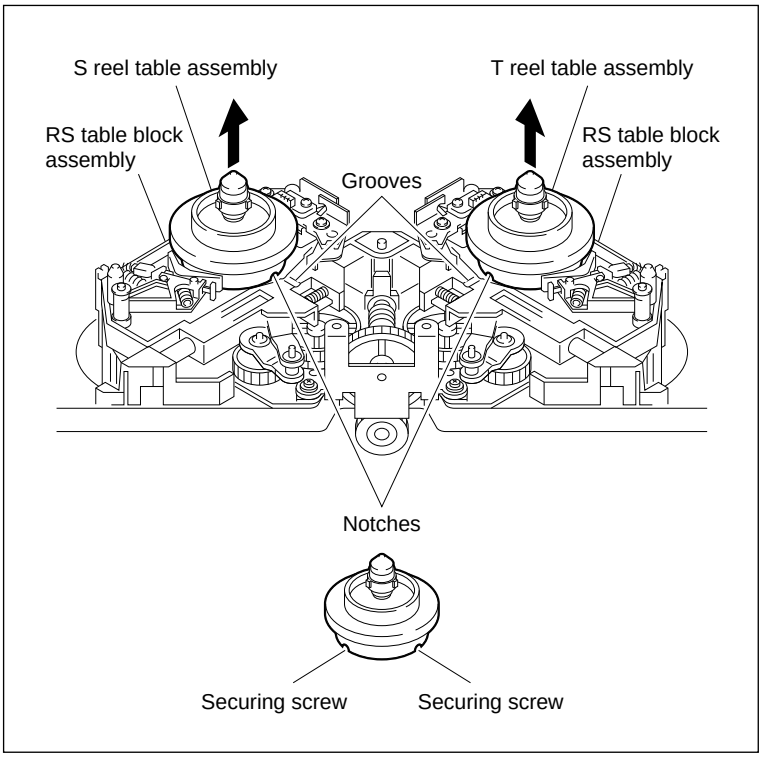
Removal

1. Remove the Reel Table Assembly

(1) Align one of the two notches at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(2) Insert the L wrench into the notch at the bottom of the reel table assembly along the groove of the RS table block assembly.
(3) Loosen the screw.
(4) Align the other notch at the bottom of the reel table assembly with the groove position of the RS table block assembly.
(5) Loosen the screw in the same way as in step (2).
(6) Remove the reel table assembly.

Note

A polywasher may be attached together when the reel table assembly is removed. In this case, remove the polywasher from the reel table assembly and return it to the reel motor shaft. The polywasher is used for reel table height adjustment.



Remove the Reel Table Assembly

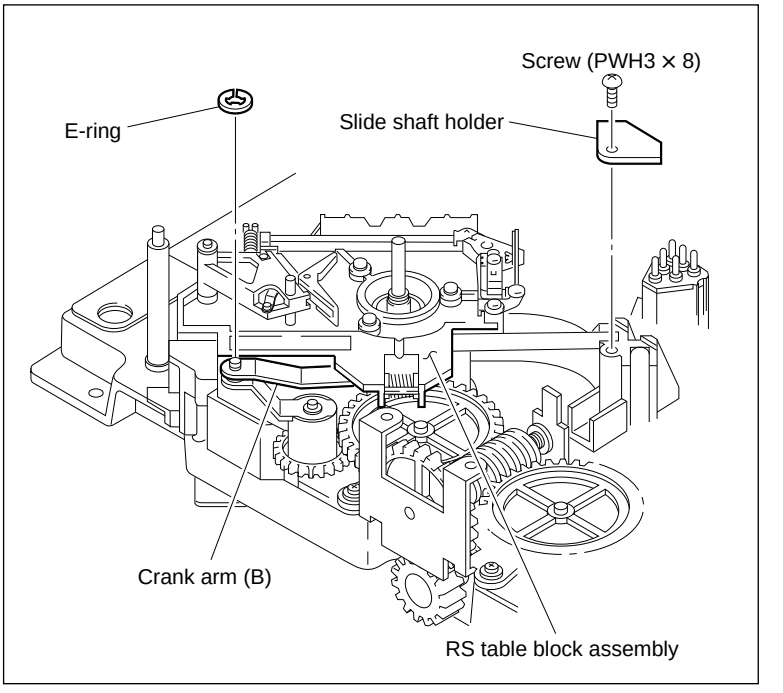
2. Remove the Crank Arm and Slide Shaft Support

(1) Set the RS table block assembly to the intermediate position between S and L cassettes.

Note

The RS table block assembly cannot be removed in the S or L cassette position.

(2) Remove the E ring, then remove the crank arm (B).
(3) Remove the screw, then remove the slide shaft support.



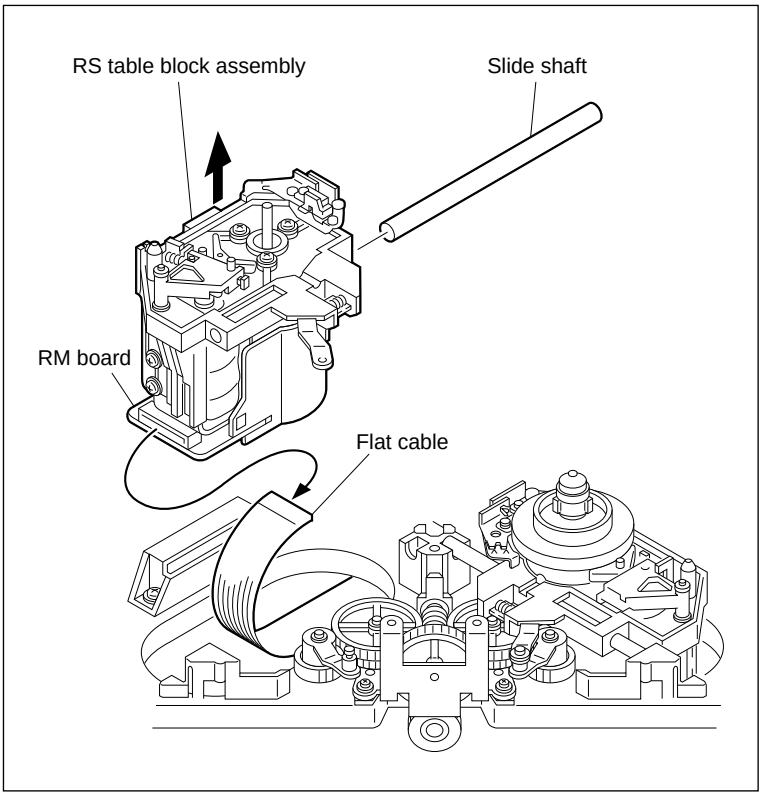
Remove the Crank Arm and Slide Shaft Support

3. Remove the RS Table Block Assembly

(1) Remove the RS table block assembly while pulling out the slide shaft.
(2) Disconnect the flat cable from the connector on the RM board.
(3) Wipe the grease attached on the two holes, from which the slide shaft of the RS table block assembly was pulled out, with cloth.
(4) Wipe the grease attached on the surface of the slide shaft with cloth.

Notes

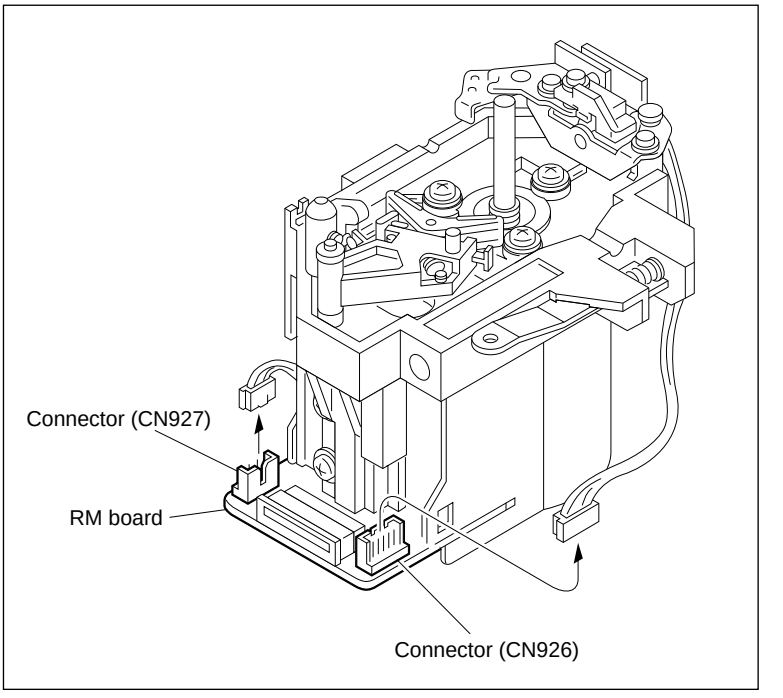
- Be careful the grease on the slide shaft does not adhere to other parts.
- Be careful not to damage the slide shaft.



Remove the RS Table Block Assembly

4. Disconnect the Harness

Disconnect the harness from the connectors CN926 and CN927 on the RM board.



Disconnect the Harness

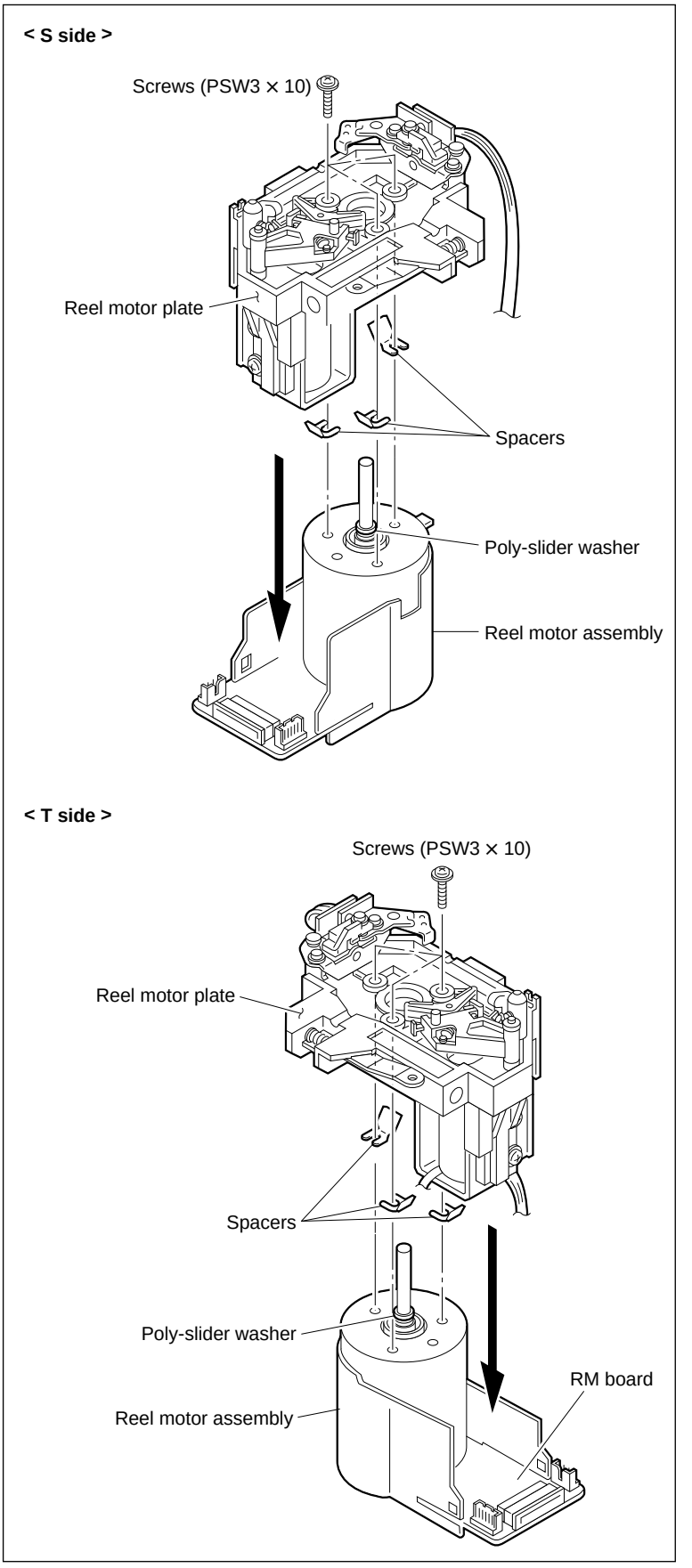
http://getMANUAL.com

5. Remove the Reel Motor Assembly

Remove the three screws, then remove the reel motor assembly.

Notes

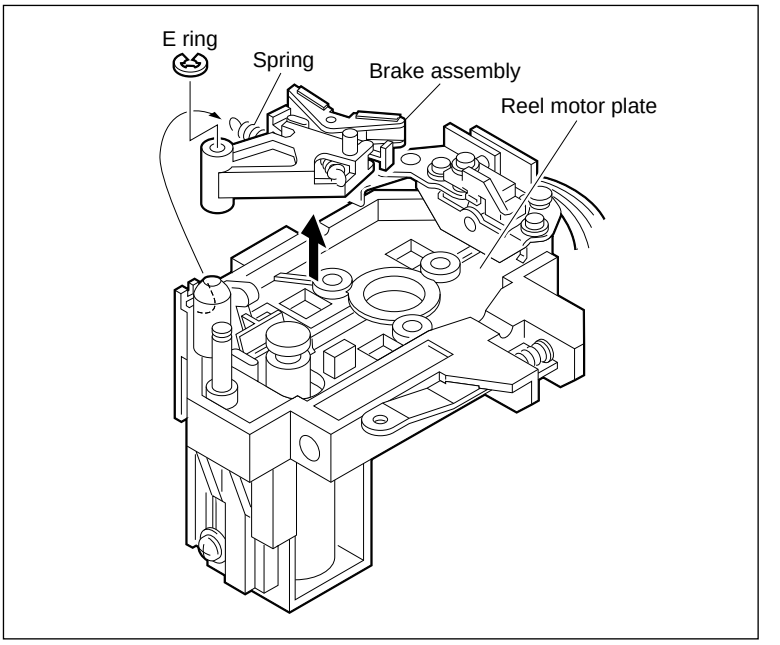
- Spacers are inserted between the reel motor and reel motor plate.
  These spacers are also removed together when the reel motor assembly is removed. Be careful not to lose them.
- Do not remove the polywasher that is passed through the reel motor shaft.



Remove the Reel Motor Assembly

6. Remove the Brake Assembly

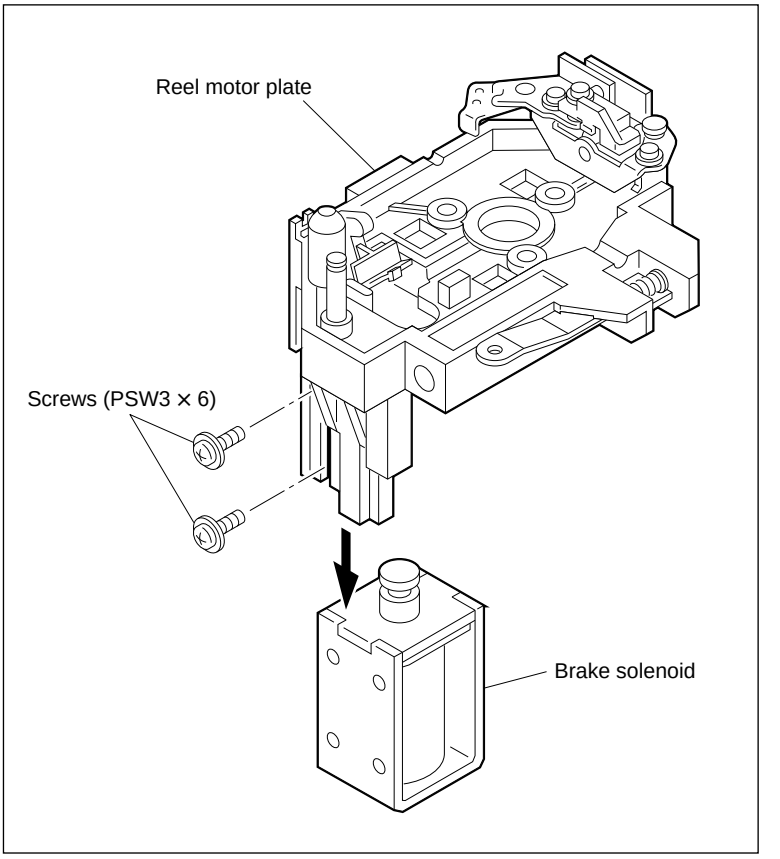
(1) Remove the spring put on the reel motor plate.
(2) Remove the E ring, then remove the brake assembly.



Remove the Brake Assembly

7. Remove the Brake Solenoid

Remove the two screws, then remove the brake solenoid.

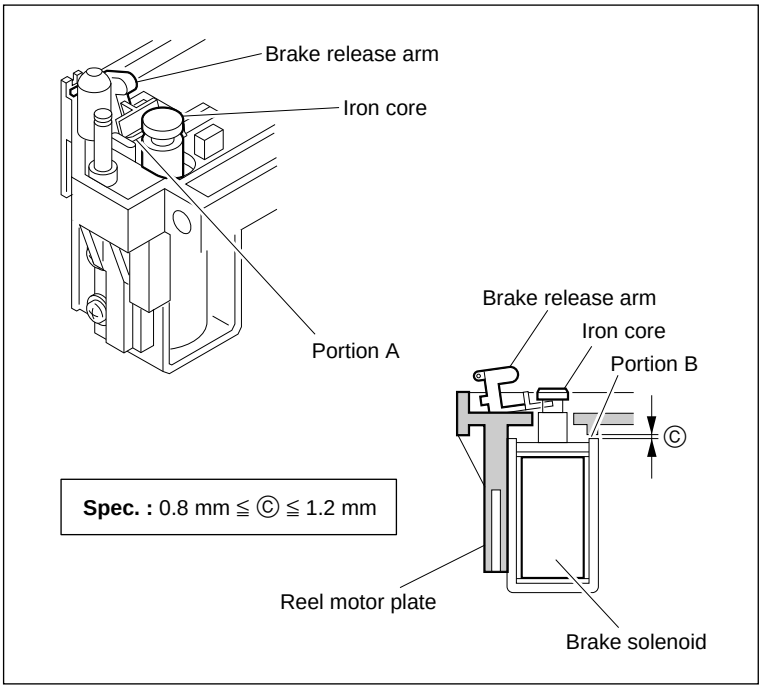


Remove the Brake Solenoid

Installation

8. Install the Brake Solenoid

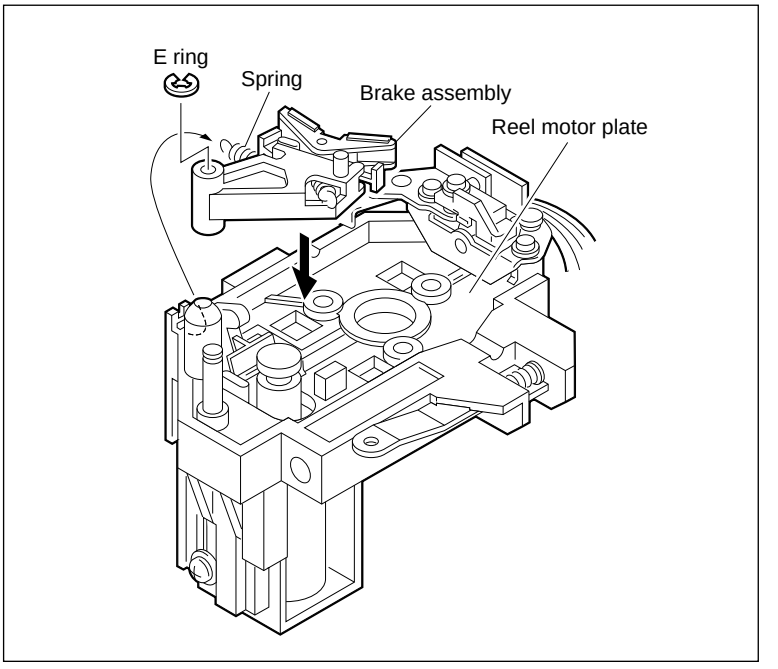
(1) Attach the brake solenoid temporary with two screws while inserting portion A of the brake release arm into the groove of the iron core.
(2) Put a thickness gauge (1.00 mm thick) between the solenoid and reel motor plate (portion B).
(3) Tighten the screws while pushing the solenoid slightly against the reel motor plate.
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the solenoid and reel motor plate satisfies the specification.



Install the Brake Solenoid

9. Install the Brake Assembly

(1) Pass the brake assembly through the shaft of the reel motor plate.
(2) Put the spring on the reel motor plate.
(3) Fix the brake assembly using an E ring.
E ring (2.3): 7-624-105-04



Install the Brake Assembly

10. Cleaning

Clean the installation surface of the reel motor assembly and reel motor plate.

11. Install the Reel Motor Assembly

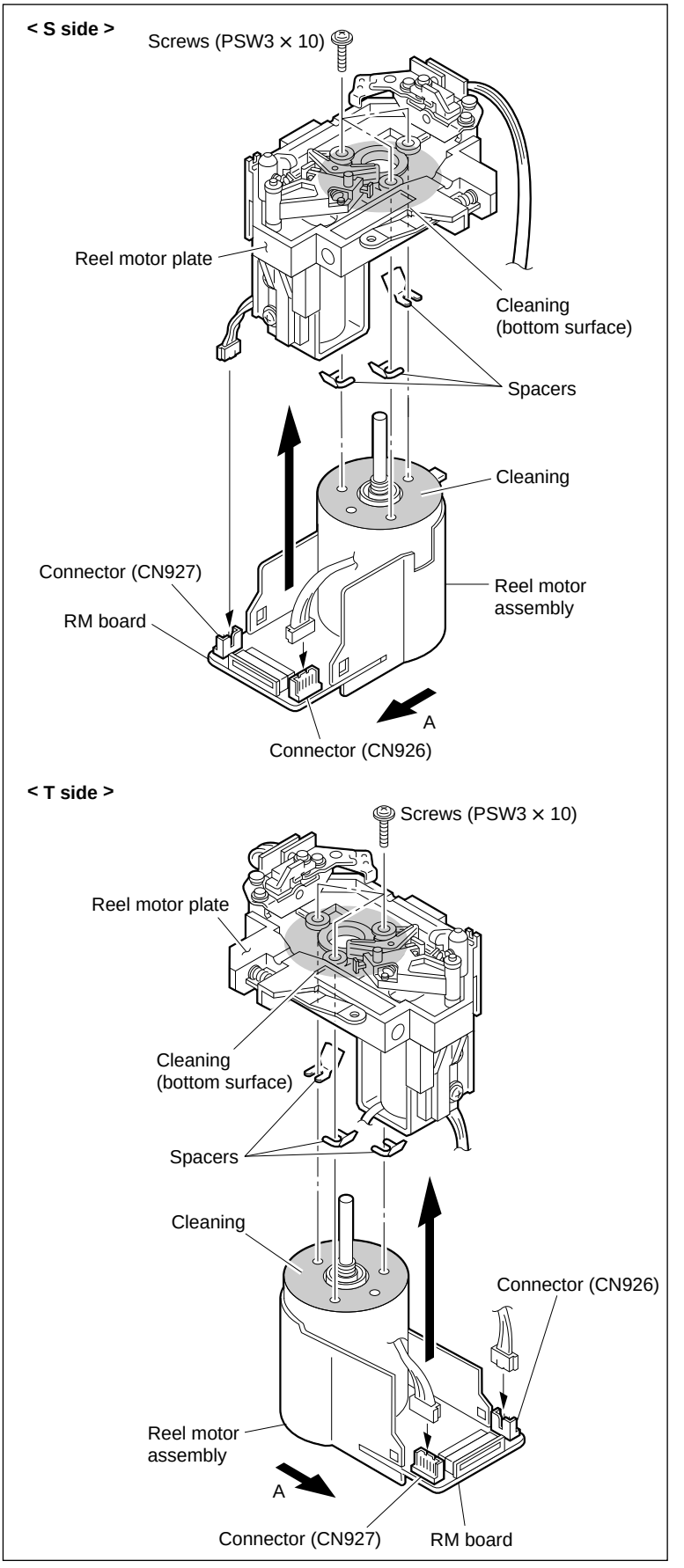
(1) Pass the reel motor assembly through the hole of the reel motor plate in the direction shown in the figure.

(2) Move the reel motor assembly in the direction indicated by arrow A and tighten the three screws gradually.

Tightening torque: 68.6×10^{-2} N • m
(7.0 kgf • cm)

12. Connect the Harness

Connect the connectors to CN926 and CN927 on the RM board.



Install the Reel Motor Assembly

13. Connect the Flat Cable

(1) Clean the flat cable plug-in port on the RM board.
(2) Connect the flat cable disconnected in step 3 to the connector.

Notes

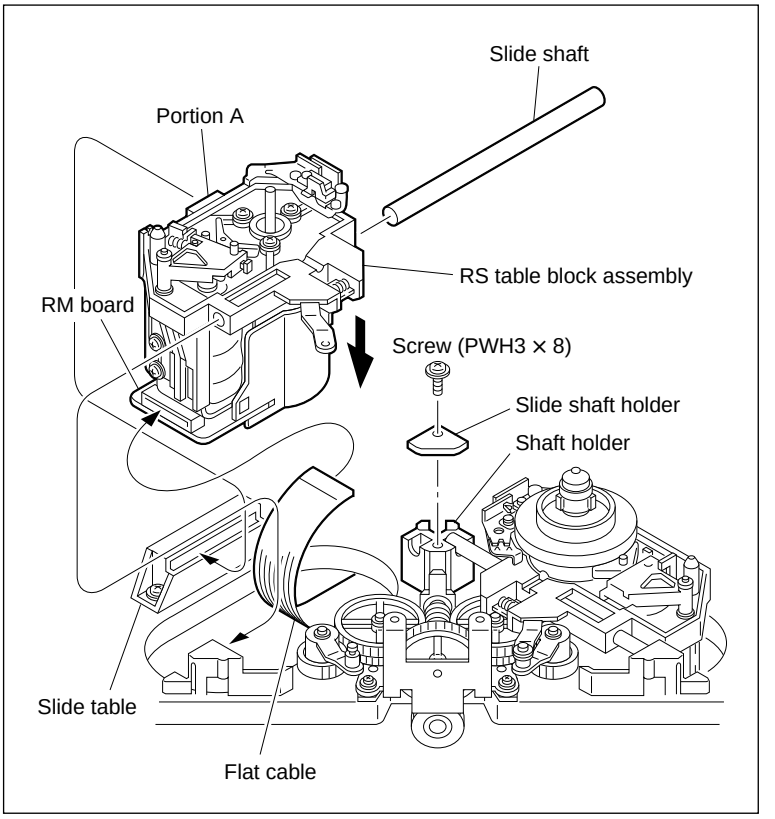
- Connect the flat cable with the conductor plating part (printing side) up.
- Be careful not to bend the flat cable when it is connected.

14. Install the Slide Shaft

Pass the slide shaft through the hole of the RS table block assembly.

15. Install the RS Table Block Assembly

(1) Put the slide shaft in the shaft holder while inserting portion A of the RS table block assembly shown in the figure into the slide table.
(2) Install the slide shaft support.



Install the RS Table Block Assembly

16. Applying Grease to Slide Shaft

(1) Apply grease slightly to the slide shaft and extend it to the whole slide shaft.
(2) Confirm that the RS table block assembly moves smoothly when it is shifted to the S- and L-cassette positions.

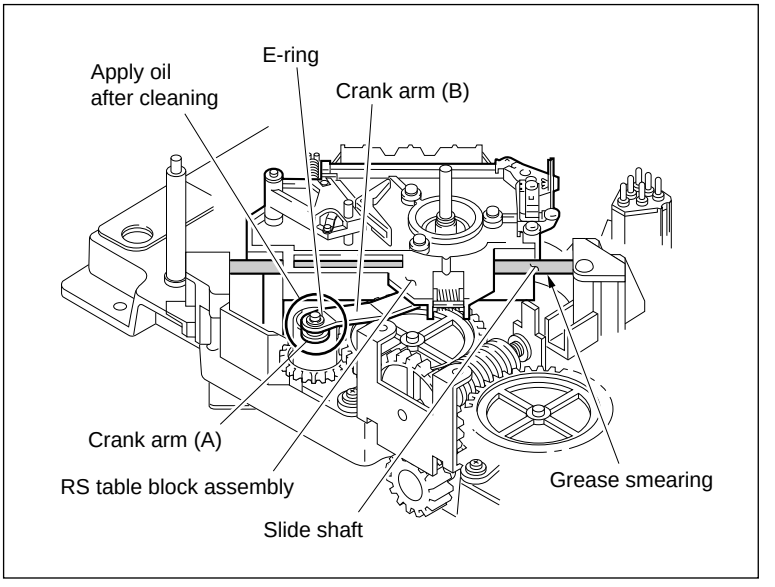
17. Install the Crank Arm

(1) Clean the shaft of the crank arm (A) and apply one drop of oil to it.
(2) Confirm that the RS table block assembly is in the intermediate position between S and L cassettes.

Note

Install the crank arm in the intermediate position between S and L cassettes for the adjustment of gear phase.

(3) Install the crank arm (B) in the shaft of the crank arm (A) using an E ring.



Applying Grease to Slide Shaft/Crank Arm Installation

Adjustment after Replacement

18. Confirm the Reel Motor Shaft Slantness

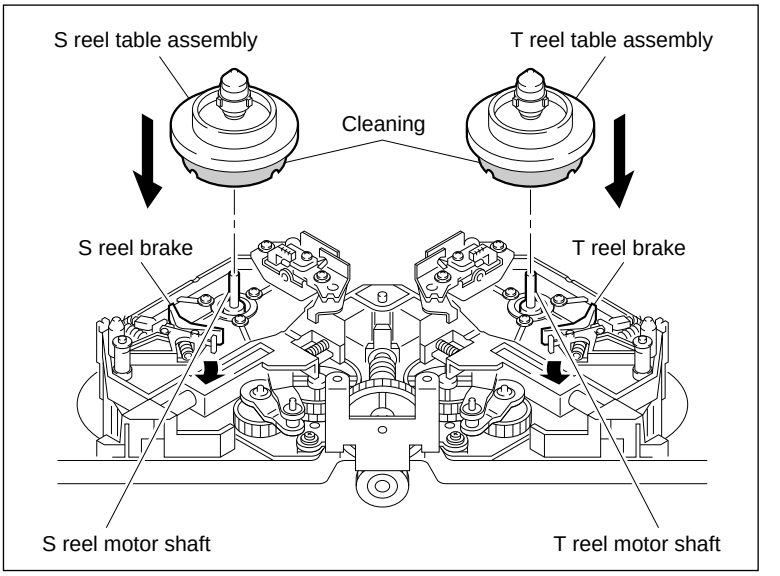
Refer to Section 3-15-2.

19. Install the Reel Table Assembly

(1) Clean the circumference of the reel table assembly.
(2) Push the reel brake in the direction indicated by the arrow to make free, and pass the reel table assembly through the reel motor shaft.

Note

Tighten the two set screws of the reel table assembly after reel table height adjustment.



Install the Reel Table Assembly

20. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

21. Confirm the Reel Table Height

Refer to Section 3-13-1.

22. Confirm the Reel Brake Clearance

Refer to Section 3-13-2.

23. Confirm the Reel Brake Release

Refer to Section 3-13-3.

24. Confirm the Brake Solenoid Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C021: S REEL BRAKE/C022: T REEL BRAKE)

3-17. Reel Shift Gear Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 in Section 3-15-1.)
2. Remove the Reel Shift Gear
3. Remove the Crank Gear
4. Install the Crank Gear
5. Install the Reel Shift Gear
6. Grease Smearing (Warm Gear)
7. Install the RS Table Block Assembly (Refer to procedures 9 through 13 in Section 3-15-1.)
8. Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height (Refer to Section 3-15-3.)

Notes

- This section describes the reel shift gear replacement. The replacement of the warm wheel, crank gear, and crank arm is also the same as for this replacement procedure.
- Procedures 3 and 4 are not required when the reel shift gear or warm wheel is replaced.
- Use a new stop washer when the reel shift gear, warm wheel, crank gear, and crank arm are replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Oil: 7-661-018-18
- Grease (SGL-601): 7-651-000-10
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the RS Table Block Assembly

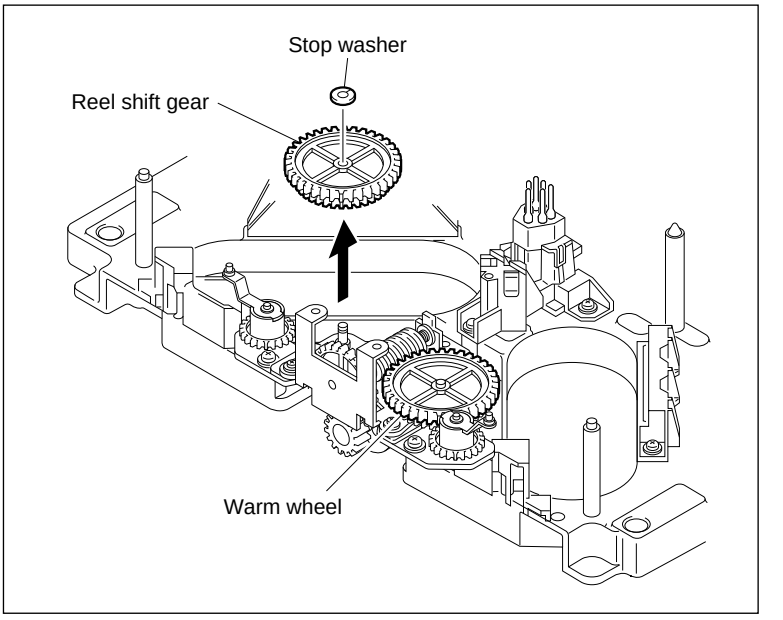
Remove the RS table block assembly with the reel table assembly attached.
(Refer to procedures 1 through 3 in Section 3-15-1.)

2. Remove the Reel Shift Gear

Remove the stop washer, then remove the reel shift gear.

Note

Do not reuse the stop washer.



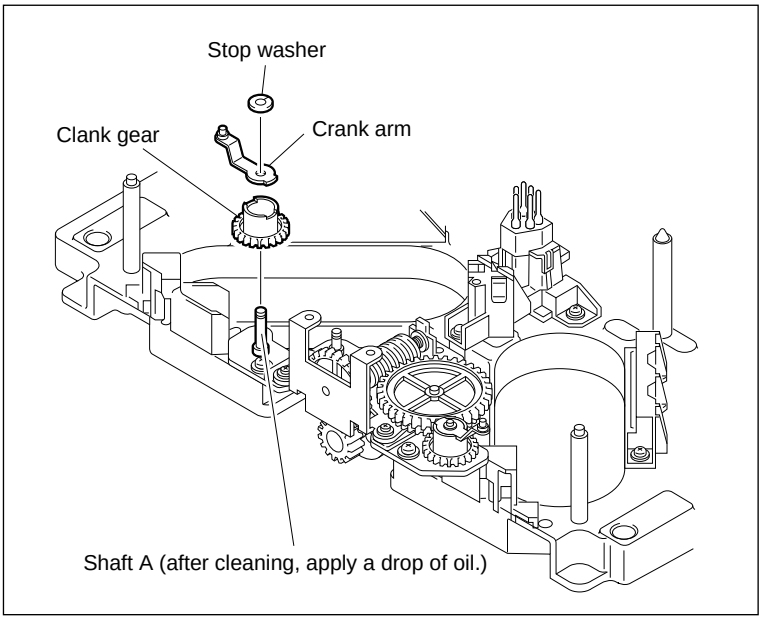
Remove the Reel Shift Gear

3. Remove the Crank Gear

(1) Remove the stop washer, then remove the crank gear.
(2) Take out the crank arm from the crank gear.

Note

Do not reuse the stop washer.



Remove /Install the Crank Gear

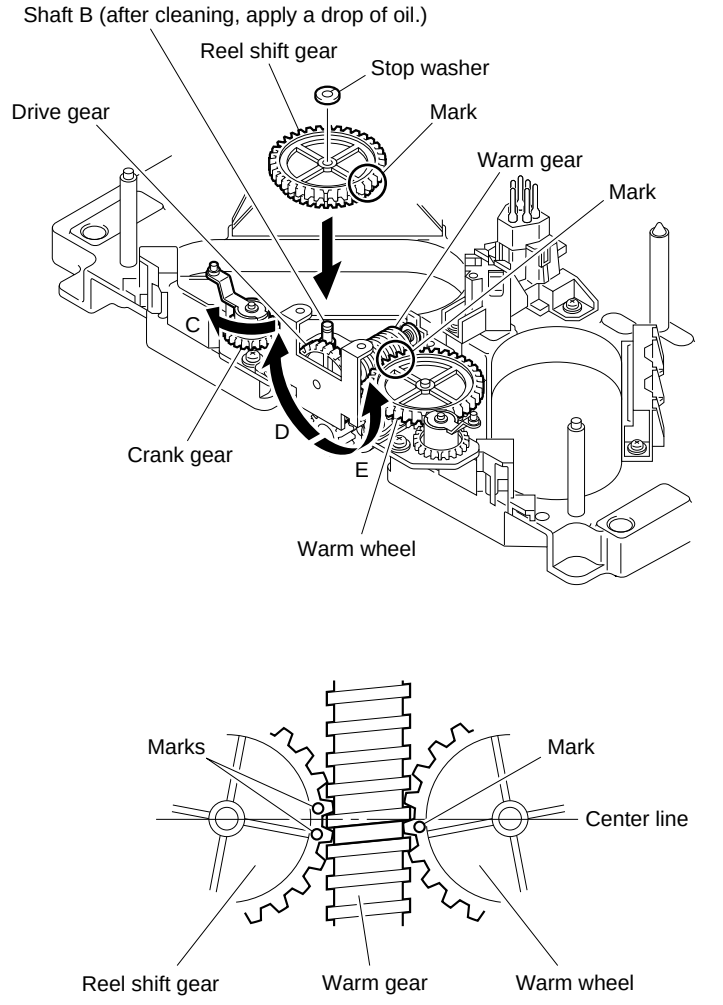
Installation

4. Install the Crank Gear Installation

(1) Clean shaft A.
(2) Apply one drop of oil to shaft A.
(3) Combine the crank arm with the crank gear.
(4) Pass the crank gear through the shaft A.
(5) Fix the crank gear using a new stop washer.

5. Install the Reel Shift Gear

(1) Clean shaft B.
(2) Apply one drop of oil to shaft B.
(3) Turn the crank gear fully in the direction indicated by arrow C.
(4) Turn the drive gear and put the mark of the warm wheel in the illustrated position.
(5) Align the mark of the reel shift gear with that of the warm wheel and pass the reel shift gear through shaft B while engaging it with the warm gear and crank gear.
(6) Rotate the drive gear in the direction indicated by arrow D by three to five turns, then rotate it fully in the direction of arrow E. At that time, confirm that the reel shift gear and warm wheel satisfy the specification.
(7) Fix the reel shift gear using a stop washer.



Spec. : The mark of the reel shift gear and the mark of the warm wheel are in the portion shown in the figure.

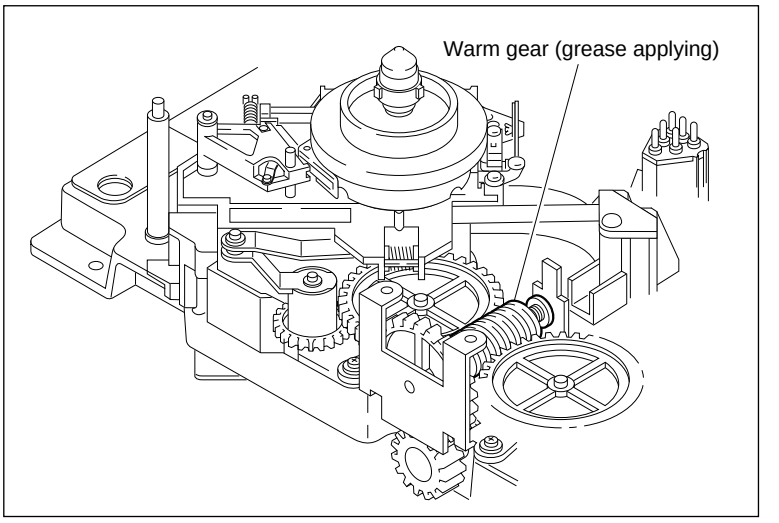
Install the Reel Shift Gear

6. Grease Smearing

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.

7. Install the RS Table Block Assembly

Refer to procedures 9 through 13 in Section 3-15-1.



Grease Smearing

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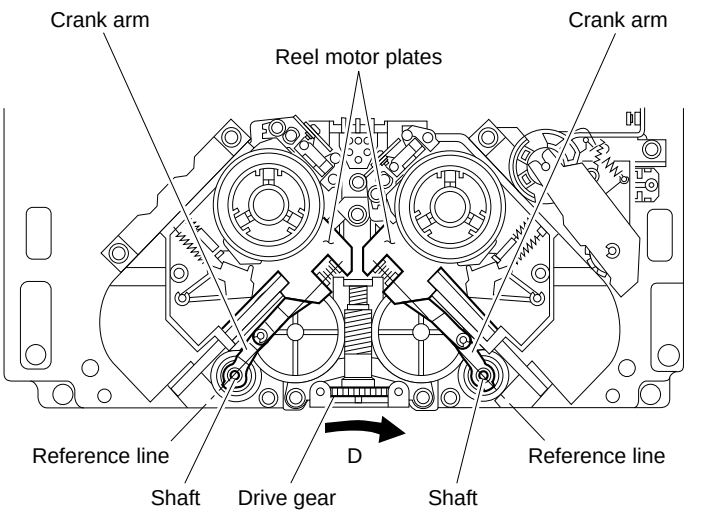
8. Confirm the Reel Shift Gear Operation

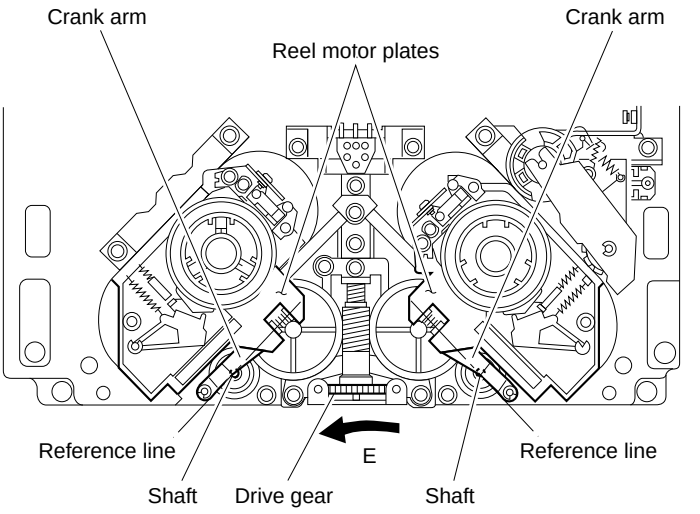
(1) Confirm that the crank arms on the supply and take-up sides operate in the same phase while turning the drive gear in the directions indicated by arrows D and E.

(2) Confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow D until it stops. (Fig. A) Similarly, confirm that the crank arm is nearer to the reel motor plate than the reference line when the drive gear is rotated in the direction indicated by arrow E until it stops. (Fig. B)

<Fig. A>



<Fig. B>



Confirm the Reel Shift Gear Operation

Adjustment after Replacement

9. Adjust the Cassette Pillar Height

Refer to Section 3-15-3.

3-18. Reel Shift Motor Replacement

Outline

Replacement

1. Remove the RS Table Block Assembly (Refer to procedures 1 through 3 in Section 3-15-1.)
2. Remove the Reel Shift Assembly
3. Remove the M Gear
4. Remove the Reel Shift Motor
5. Remove the CCM-15 Board
6. Install the CCM-15 Board
7. Install the Reel Shift Motor
8. Install the M Gear
9. Install the Reel Shift Assembly
10. Grease Smearing (Warm Gear)
11. Install the RS Table Block Assembly (Refer to procedures 9 through 13 in Section 3-15-1.)

Adjustment after Replacement

12. Adjust the Cassette Pillar Height (Refer to Section 3-15-3.)
13. Check the Reel Shift Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.)
    (C016: REEL SHIFT MOTOR)

Notes

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver hexagonal bit (Across flat has 0.89 mm, l = 50 mm): J-6323-440-A
- Thickness gauge: 9-911-053-00
- Grease (SGL-601): 7-651-000-10
- Oil: 7-661-018-18
- Locking compound : 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

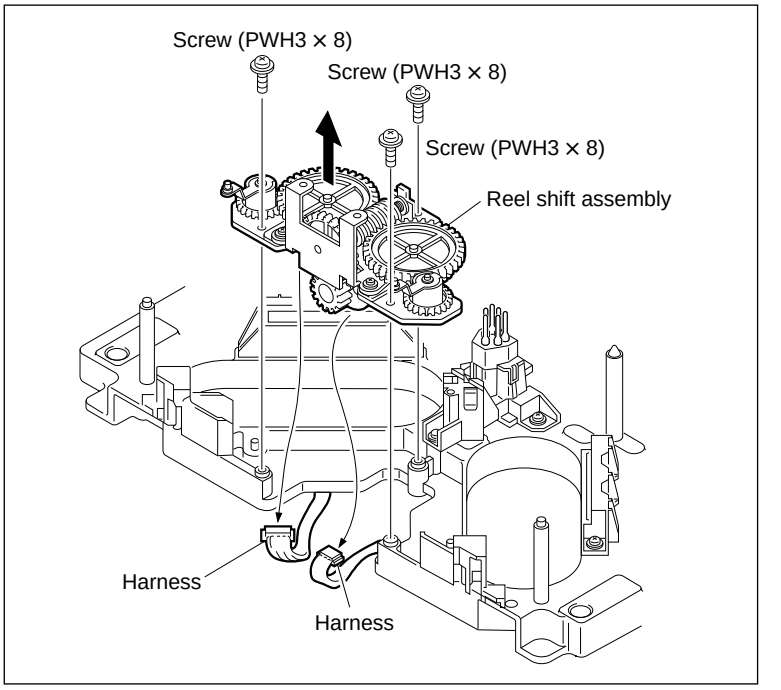
Removal

1. Remove the RS Table Block Assembly

Remove the RS table block assembly on the supply and take-up sides with the reel table assembly attached. (Refer to procedures 1 through 3 in Section 3-15-1.)

2. Remove the Reel Shift Assembly

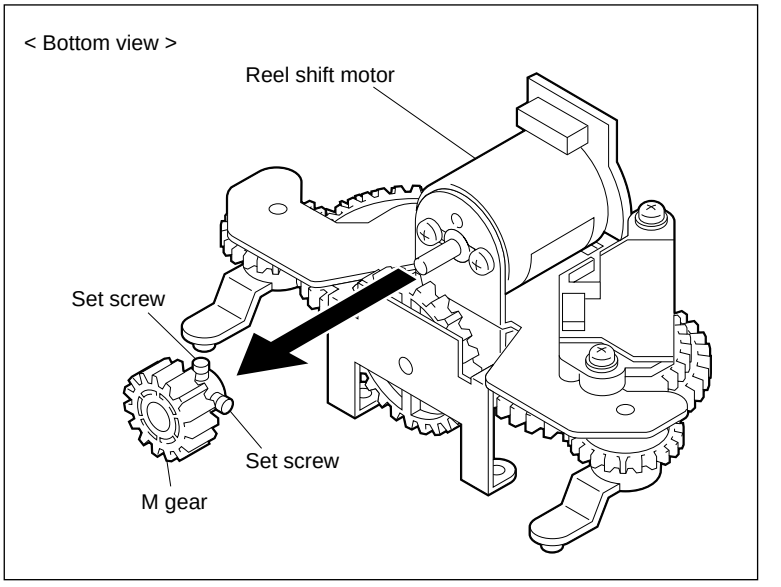
(1) Remove the three screws.
(2) Raise the reel shift assembly and disconnect the two harness shown in the figure.



Remove the Reel Shift Assembly

3. Remove the M Gear

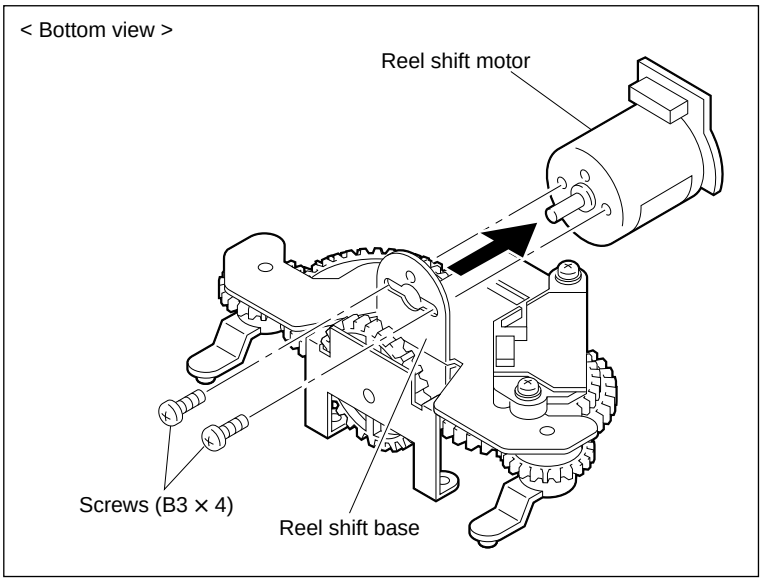
(1) Loosen the two set screws shown in the figure.
(2) Pull out the M gear from the shaft.



Remove the M Gear

4. Remove the Reel Shift Motor

Remove the two screws, then remove the reel shift motor from the reel shift base.



Remove the Reel Shift Motor

5. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board from the reel shift motor.

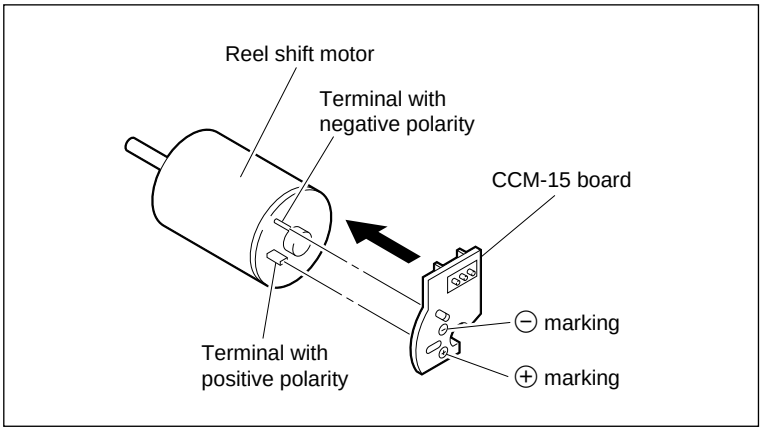
Installation

6. Install the CCM-15 Board

Pass the terminals of a new motor through the CCM-15 board, then solder.

Note

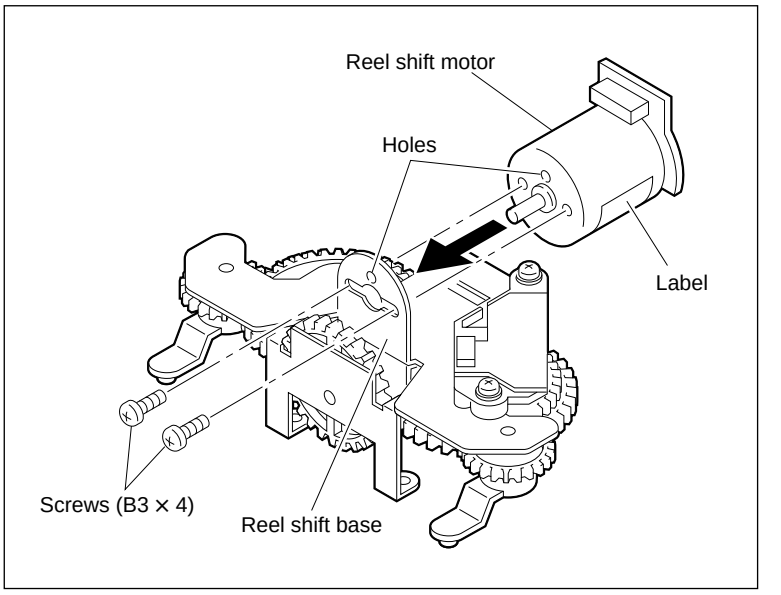
Solder so that no clearance exists between the motor and CM-15 board.



Remove /Install the CCM-15 Board

7. Install the Reel Shift Motor

(1) Align the position of the reference hole of the motor with that of the reel shift base and tighten the two screws.
(2) Apply locking compound slightly to the screws.



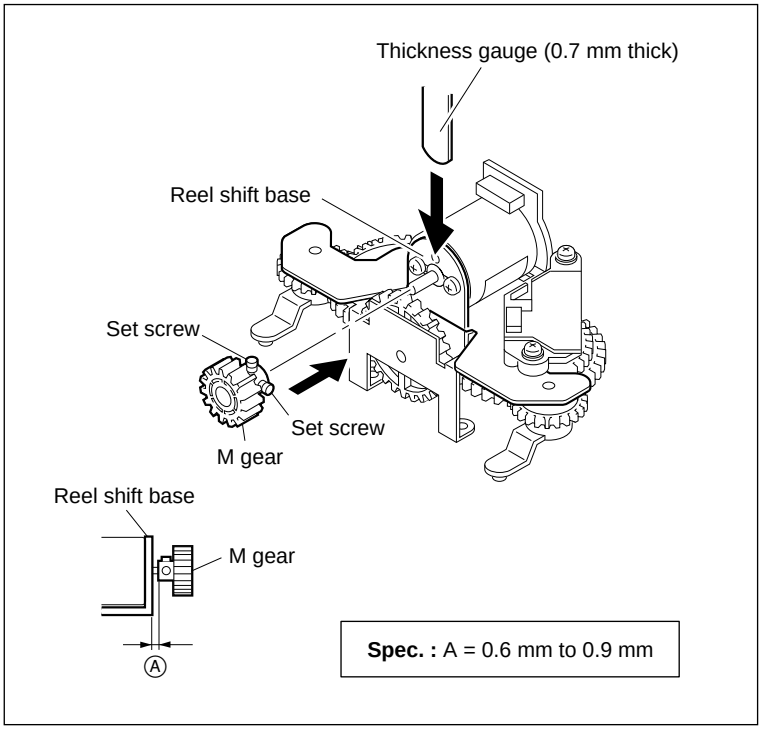
Install the Reel Shift Motor

8. Install the M Gear

(1) Pass the M gear through the shaft of the motor.
(2) Put a thickness gauge (0.7 mm thick) between the M gear and reel shift base.
(3) Tighten the two set screws while pushing the M gear toward the reel shift base.

Tightening torque: 18.6×10^{-2} N • m
(1.9 kgf • cm)

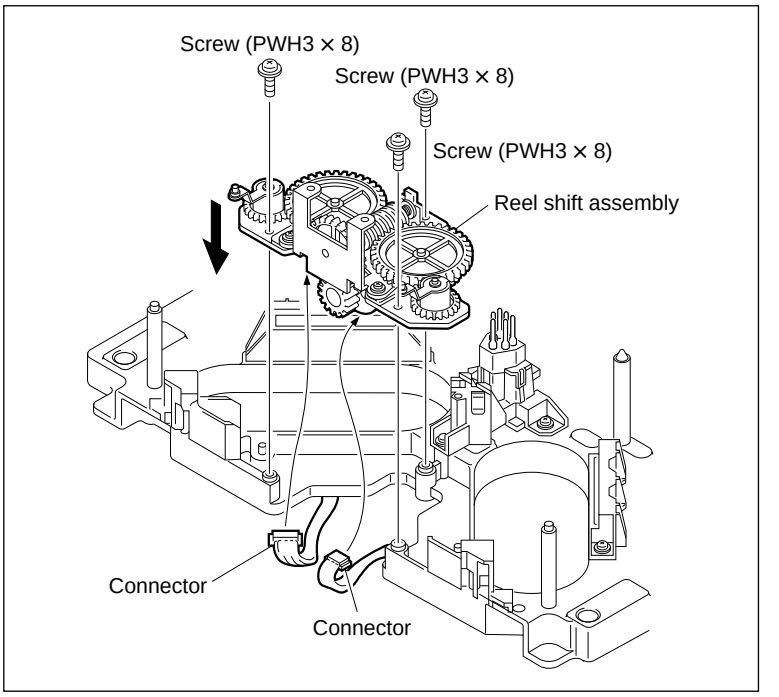
(4) Pull out the thickness gauge.
(5) Confirm that the clearance between the M gear and reel shift base satisfies the specification when the M gear is pushed toward the reel shift base.



Install the M Gear

9. Install the Reel Shift Assembly

(1) Connect the two harness disconnected in procedure 2 to the reel shift assembly.
(2) Tighten the three screws.



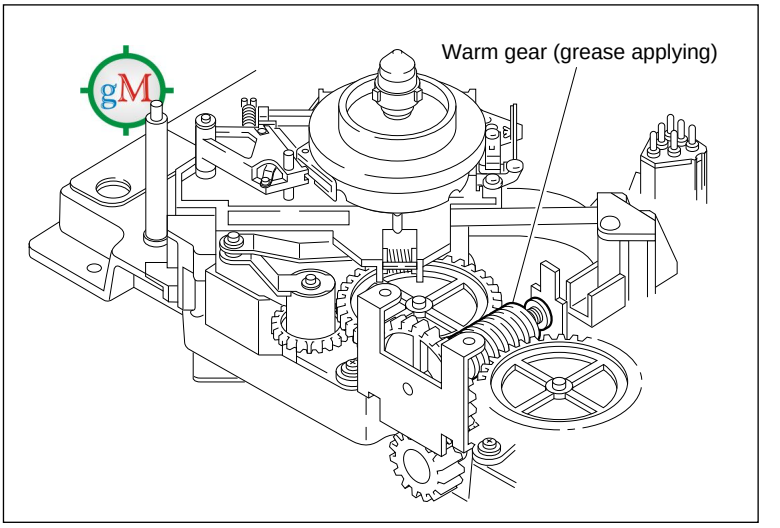
Install the Reel Shift Assembly

10. Grease Smearing

(1) Wipe the grease on the warm gear and clean it.
(2) Smear grease to the warm gear.

11. Install the RS Table Block Assembly

Refer to procedures 9 through 13 in Section 3-15-1.



Grease Applying

Adjustment after Replacement

12. Confirm the Cassette Pillar Height

Refer to Section 3-15-3.

13. Check the Reel Shift Motor Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C016: REEL SHIFT MOTOR)

3-19. Tape Guide Replacement

Note

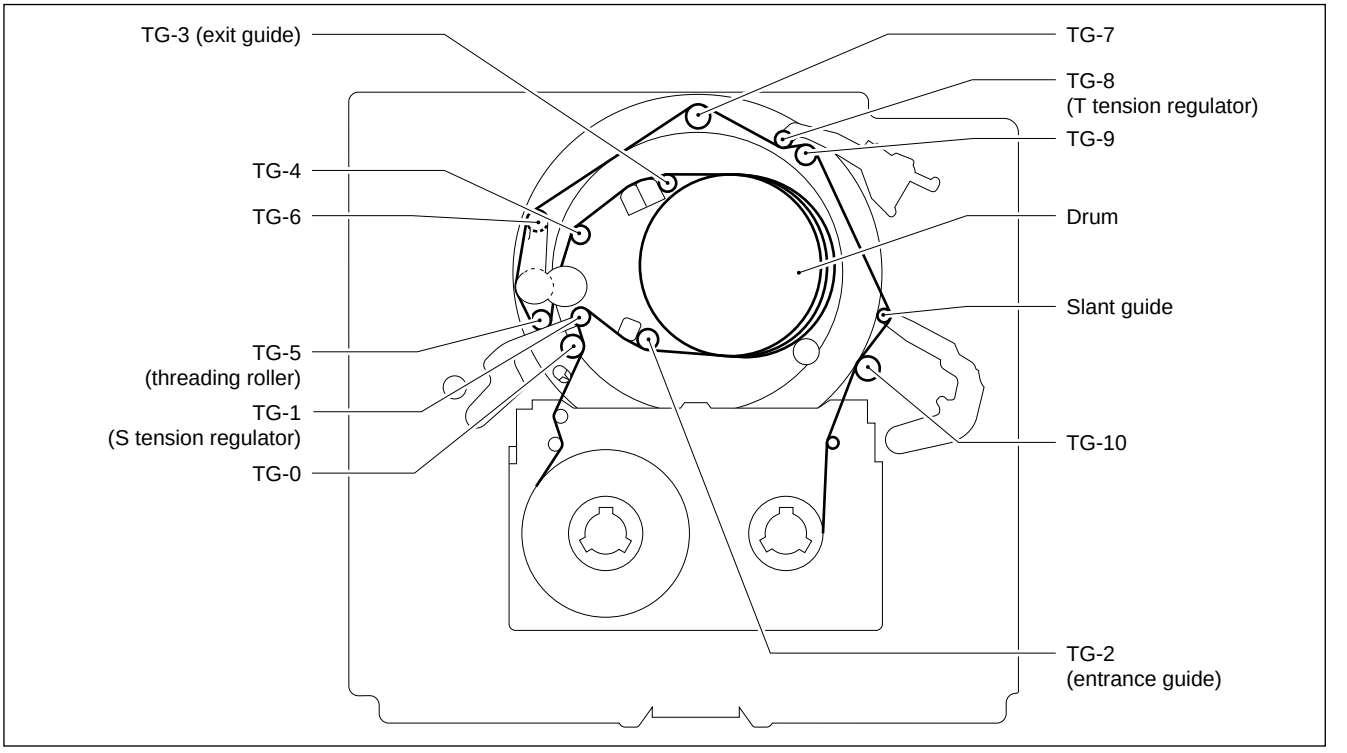
Be careful not to damage the drum when the tape guide roller is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Replacement

Perform the part replacement while referring to the exploded view.



Adjustment after Replacement

- Perform the following adjustments when any tape guide is replaced.
  ① Tape running adjustment (Refer to Section 4-1-2.)
  ② Video tracking confirmation (Refer to Section 4-1-3.)

- Perform the following adjustments when the slant guide is replaced.
  ① Slant guide slantness adjustment (Refer to Section 3-25-2.)
  ② Tape running adjustment (Refer to Section 4-1-2.)
  ③ Video tracking confirmation (Refer to Section 4-1-3.)

- Perform the following adjustments when the TG-2 or TG-3 is replaced.
  RF switching position adjustment
  (Refer to Section 4-2 of the maintenance manual part 1.)
  (A-011: RF SWITCHING POS.)

3-20. Tape Cleaner Replacement

CAUTION

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner. Never touch it with bare hands.

Outline

Replacement

1. Remove the Tape Cleaner
2. Install the Tape Cleaner

Note

The adjustment after tape cleaner replacement is not required.

Tools

- Torque screwdriver (6 kg • cm)(JB-5251): J-6252-510-A
- Torque screwdriver bit (+2 mm, l = 75 mm): J-6323-420-A

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Removal

1. Remove the Tape Cleaner

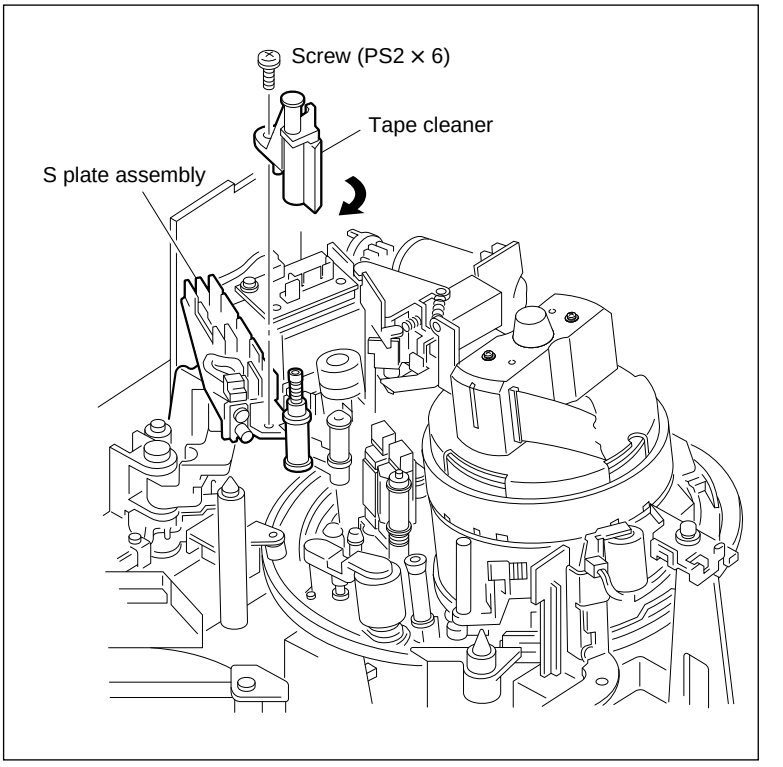
Remove the screw, then remove the tape cleaner from the S plate assembly.

Installation

2. Install the Tape Cleaner

Tighten the screw while moving a new tape cleaner clockwise.

Tightening torque: 19.6×10^{-2} N • m
(20 kgf • cm)



Remove/Install the Tape Cleaner

3-21. Gear Box Assembly and Threading Motor Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Remove the DT-34D Board
4. Remove the DR-315 Board
5. Disconnect the Harness
6. Remove the Gear Box Assembly
7. Remove the Threading Motor
8. Remove the CCM-15 Board
9. Install the CCM-15 Board
10. Install the Threading Motor
11. Install the Gear Box Assembly
12. Connect the Harness
13. Install the DR-315 Board
14. Install the DT-34D Board
15. Install the Shield Plate (Bottom)
16. Install the Bottom Plate

Adjustment after Replacement

17. Confirm the Threading Motor Operation (Refer to Section 4-2 maintenance manual part 1.) (C012: THREADING MOTOR)

Notes

- The gear box assembly supplied as repair parts may differ in two harness length from one used in this unit because of standardization of repair parts. When replacing the gear box assembly, replace the two harness by ones used in this unit according to the procedure described in this section.
- The threading motor, CCM-15 board, and gear box assembly can be replaced according to the procedure described in this section. Perform all the procedures when the threading motor or CCM-15 board is replaced. Perform procedures 1 through 6 and 11 through 17 when the gear box assembly is replaced.

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assemby. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- L wrench (Across flat has 1.27 mm): 7-700-736-01
- Locking compound: 7-432-114-11
- Thickness gauge: 9-911-053-00

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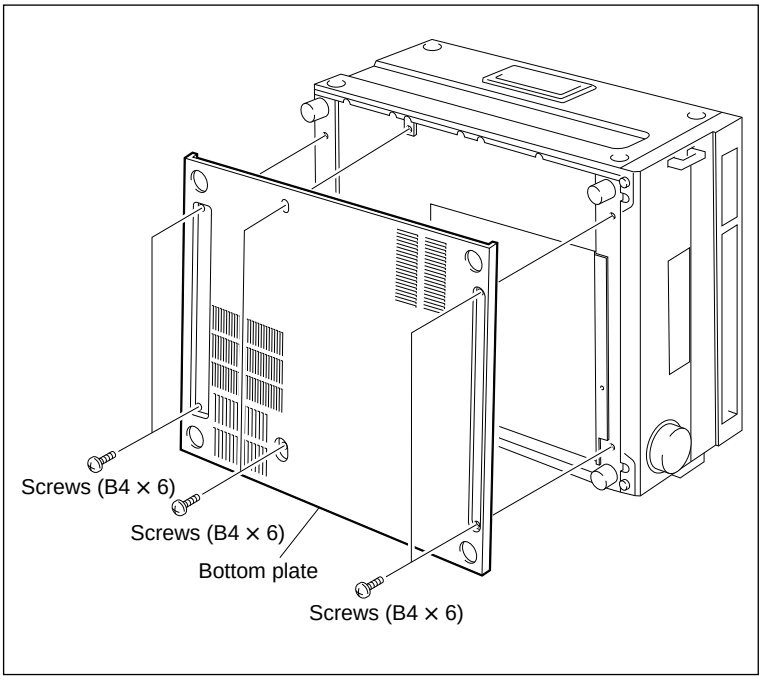
Removal

1. Remove the Bottom Plate

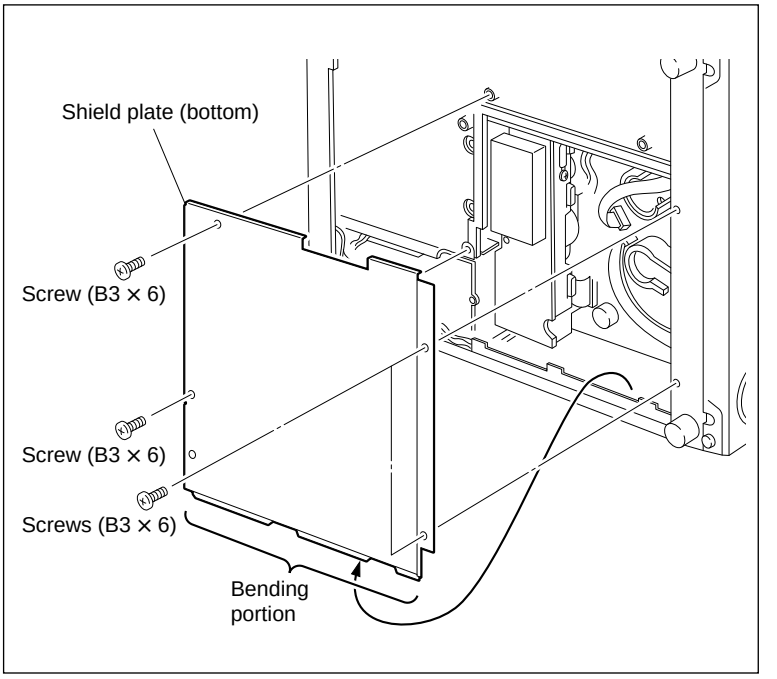
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

Remove the four screws, and then the shield plate (Bottom).



Remove the Shield Plate (Bottom)

3. Remove the DT-34D Board

Refer to procedure 2 in Section 3-12.

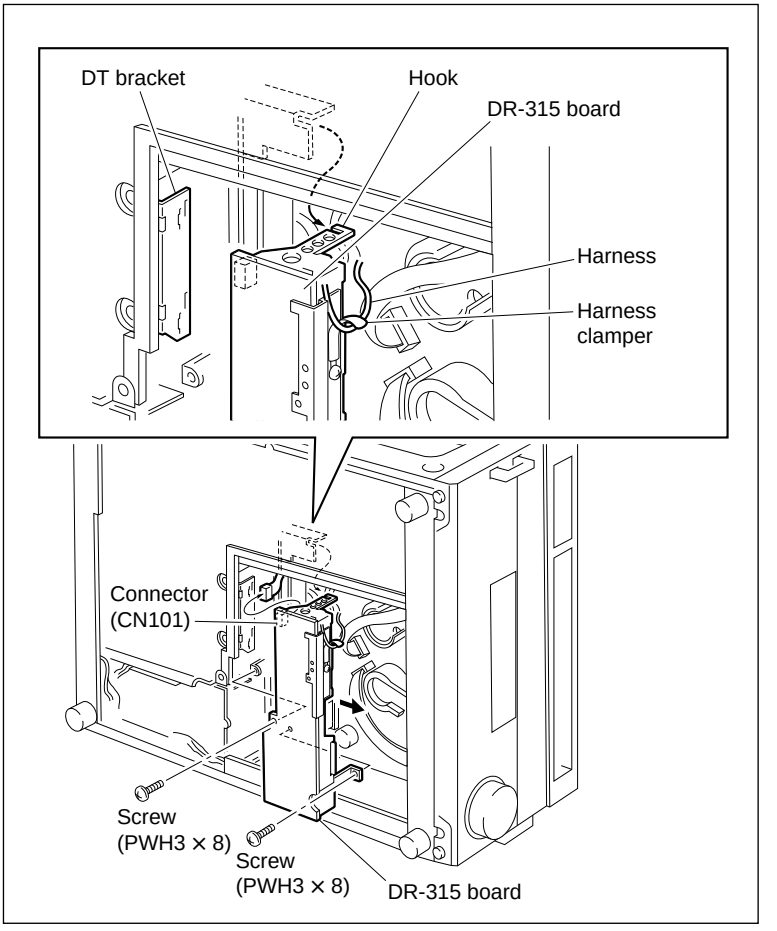
4. Remove the DR-315 Board

(1) Stretch the harness clamper on the DR-315 board and release the harnesses.
(2) Remove the two screws shown in the figure.
(3) Move the DR-315 board toward the reel motors, and detach the hook.

Note

The hook is hard to be seen since it is the inner part.

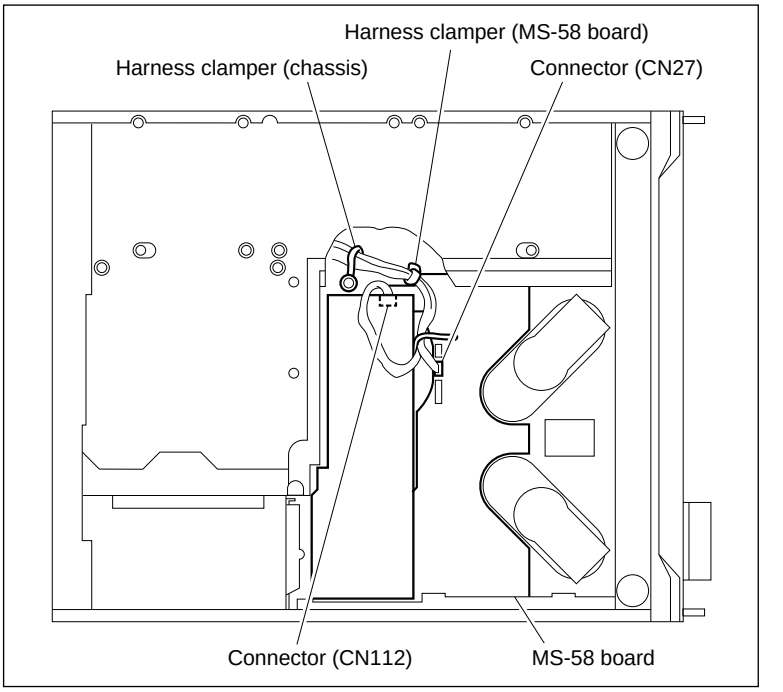
(4) Pull out the DR-315 board as far as possible as shown in the figure.



Remove the DR-315 Board

5. Disconnect the Harness

(1) Extend the two harness clampers shown in the figure.
(2) Disconnect the harness from the connector CN112 on the DR-315 board.
(3) Disconnect the harness from the connector CN27 on the MS-58 board.



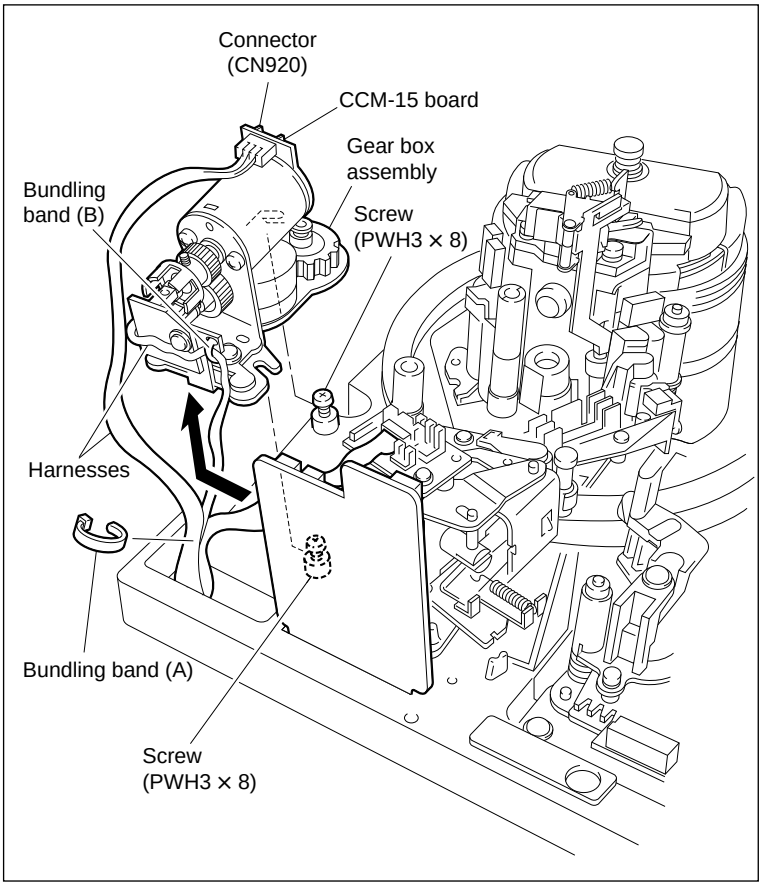
Disconnect the Harness

6. Remove the Gear Box Assembly

(1) Cut off the bundling band (A) shown in the figure.
(2) Remove the two screws and remove the gear box assembly.
(3) Cut off the bundling band (B) shown in the figure.
(4) Disconnect the two harness from the gear box assembly.

Reference

Procedures 7 through 10 are not required when the gear box assembly is replaced.



Remove the Gear Box Assembly

7. Remove the Threading Motor

(1) Loosen the set screw of the M gear.
(2) Remove the two screws fixing the motor.

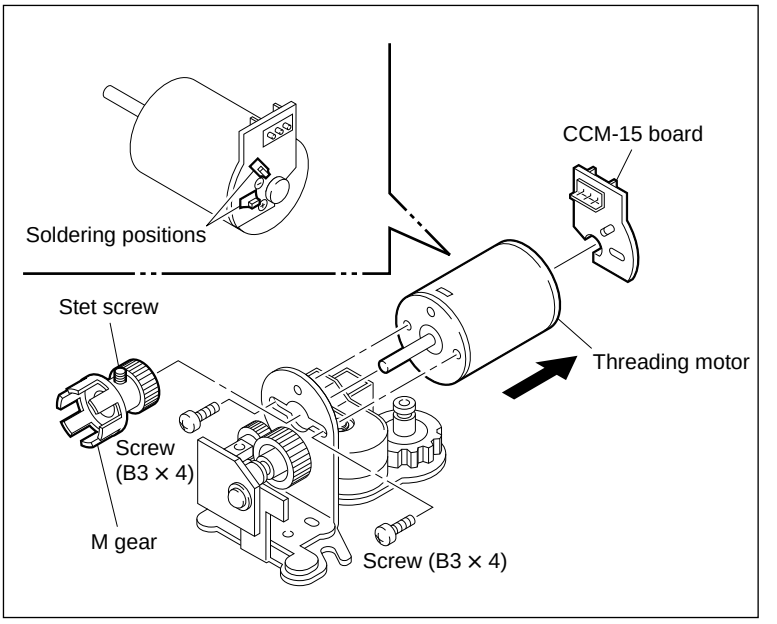
Note

Take care that the screwdriver does not strike against the M gear.

(3) Remove the motor. (The M gear can also be removed simultaneously.)

8. Remove the CCM-15 Board

Unsolder and remove the CCM-15 board.



Remove the Threading Motor

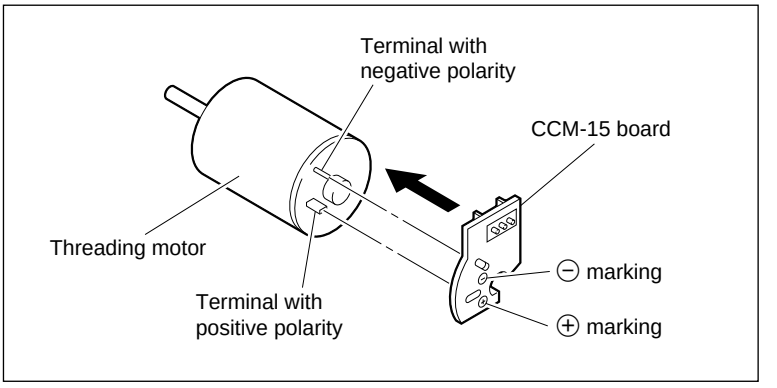
Installation

9. Install the CCM-15 Board

Pass the pins of the threading motor through the CCM-15 board and solder them.

Note

Solder so that no clearance exists between the motor and CCM-15 board.



Install the CCM-15 Board

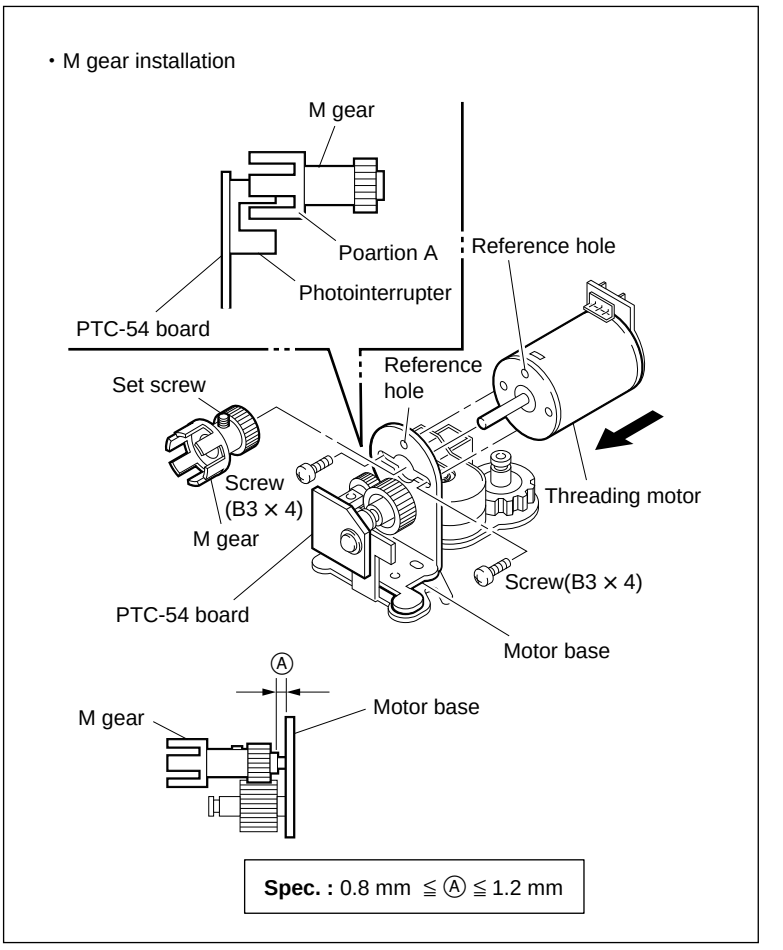
10. Install the Threading Motor

(1) Put portion A of the M gear into the photointerrupter on the PTC-54 board.
(2) Pass the motor shaft through the hole of the motor base and align the reference hole position of the motor with that of the motor base.
(3) Apply the locking compound slightly to the motor fixing screws and tighten them.

Note

Take care that the screwdriver does not strike against the M gear.

(4) Put the thickness gauge (1.0 mm thick) between the M gear and motor base.
(5) Tighten the set screw while pushing the M gear slightly toward the motor base.
(6) Pull out the thickness gauge.
(7) Confirm that the clearance between the M gear and motor base satisfies the specification when the M gear is pushed toward the motor base.
(8) Rotate the M gear manually and confirm that the M gear rotates smoothly. Moreover, confirm that the M gear does not touch the photointerrupter.



Install the Threading Motor

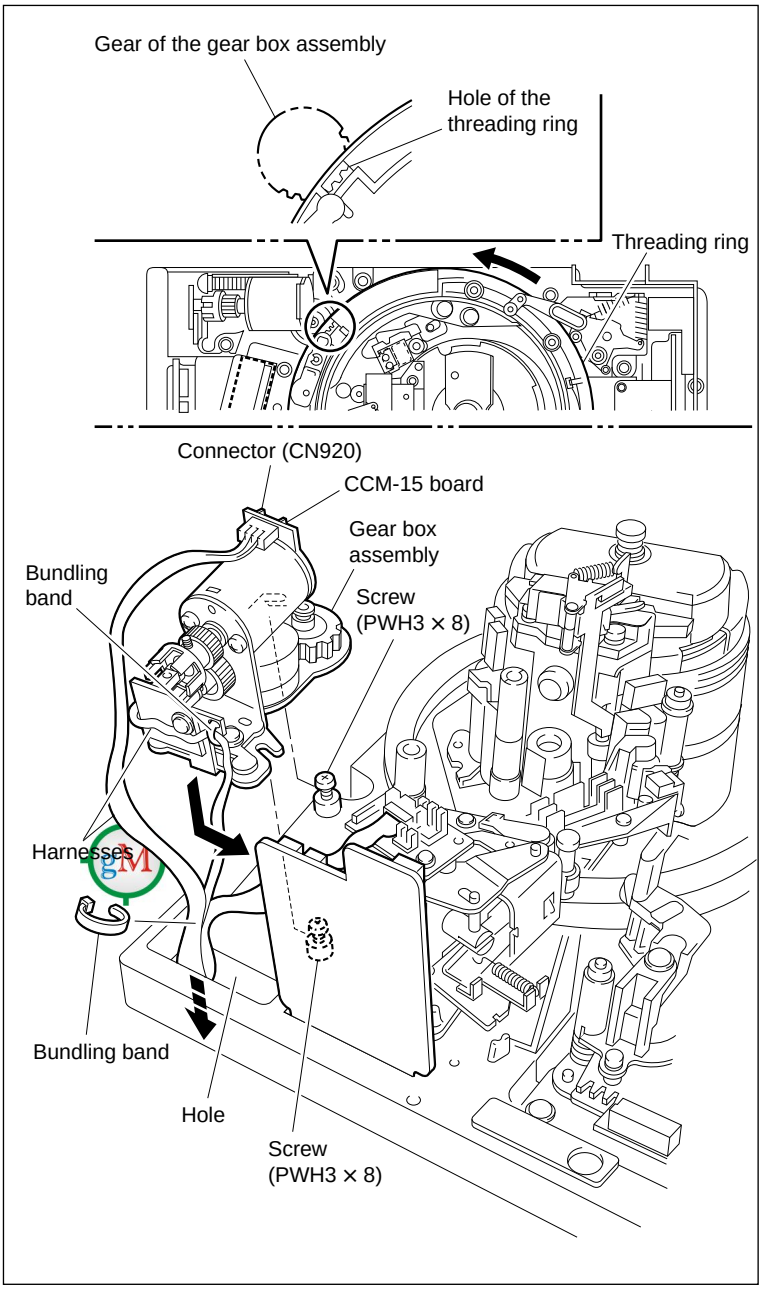
11. Install the Gear Box Assembly

(1) Disconnect the two harness from a new gear box assembly.
(2) Connect the two harness in (4) of procedure 6 to a new gear box assembly.
(3) Bundle the harness released in (3) of procedure 6 using a bundling band (or the equivalent).
(4) Rotate the threading ring so that the pinch roller places in front of the pinch solenoid.

Note

Move the hole of the threading ring to confirm the engagement of the gear when the gear box assembly is installed.

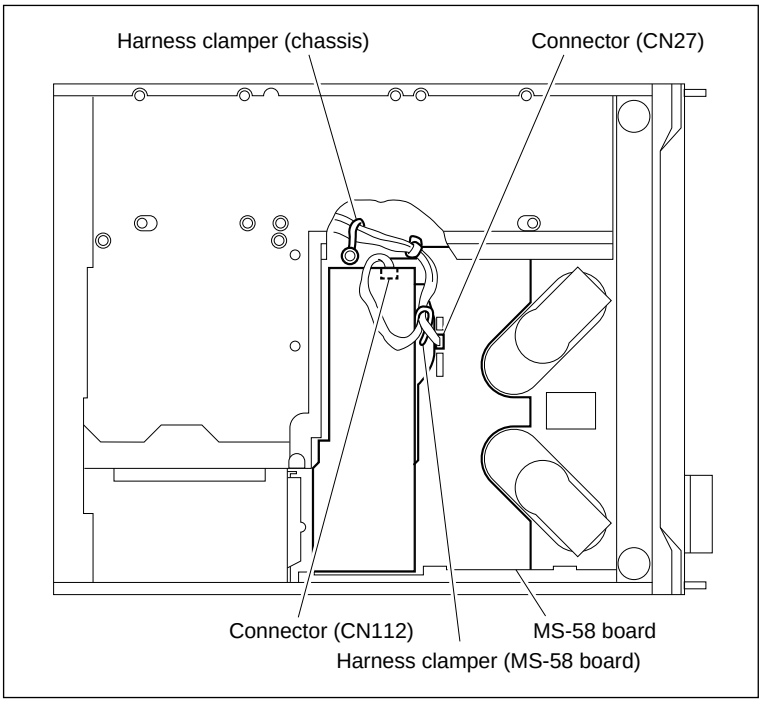
(5) Push the gear of the gear box assembly against that of the threading ring.
(6) Confirm from the hole of the threading ring that the gear of the gear box assembly engages with that of the threading ring.
(7) Tighten the screws while pushing the gear box assembly slightly toward the threading ring.
(8) Pass the two harness of the gear box assembly through the rear side from the hole of the mechanical deck, and put them to the rear side of the mechanical deck.
(9) Bundle the harnesses using the bundling bands (or the equivalent).



Install the Gear Box Assembly

12. Connect the Harness

(1) Connect a harness (3-pin) to the connector CN27 on the MS-58 board.
(2) Connect a harness (2-pin) to the connector CN112 on the DR-315 board.
(3) Fix the harness using the two harness clampers (chassis).



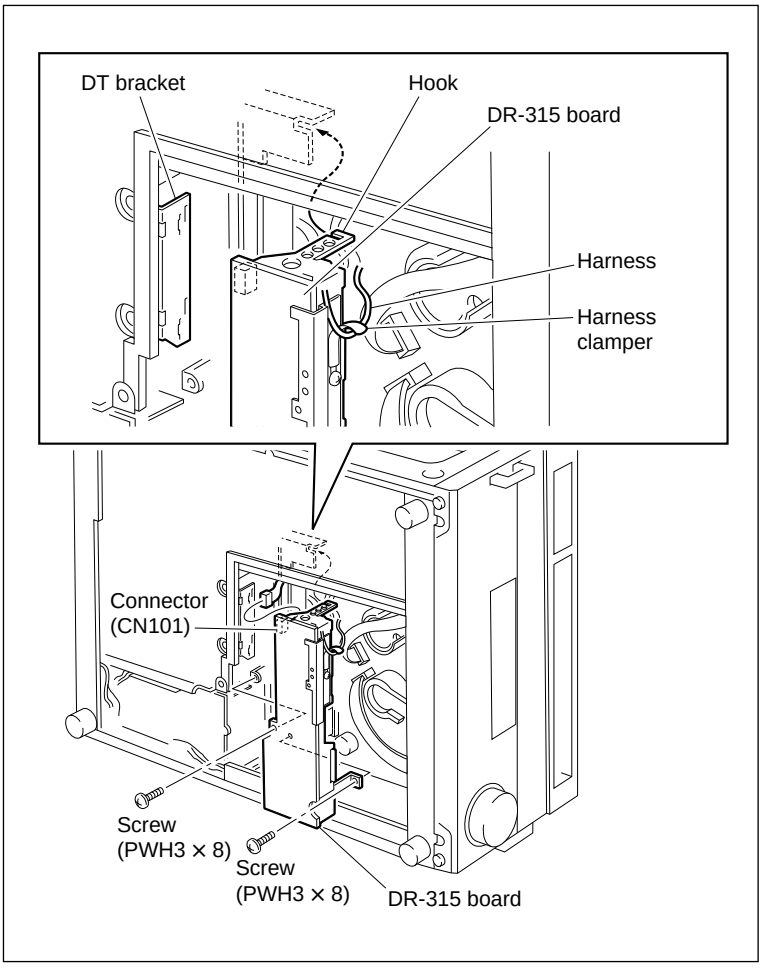
Connect the Harness

13. Install the DR-315 Board

(1) Put the hook of the DR-315 board into the notch of the chassis shown in the figure.
(2) Install the DR-315 board and tighten with the two screws.
(3) Clamp the harness released on the procedure 4-(1).

14. Install the DT-34D Board

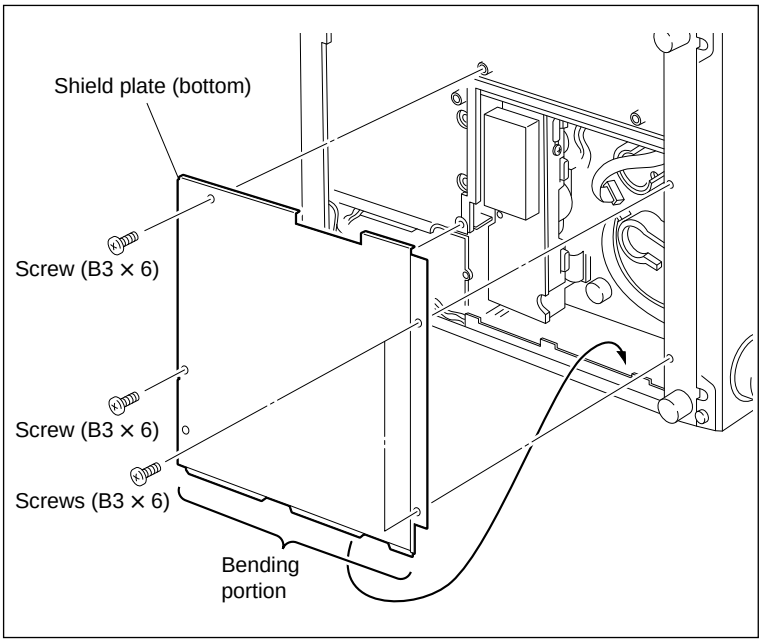
Refer to procedure 9 in Section 3-12.



Install the DR-315 Board

15. Install the Shield Plate (Bottom)

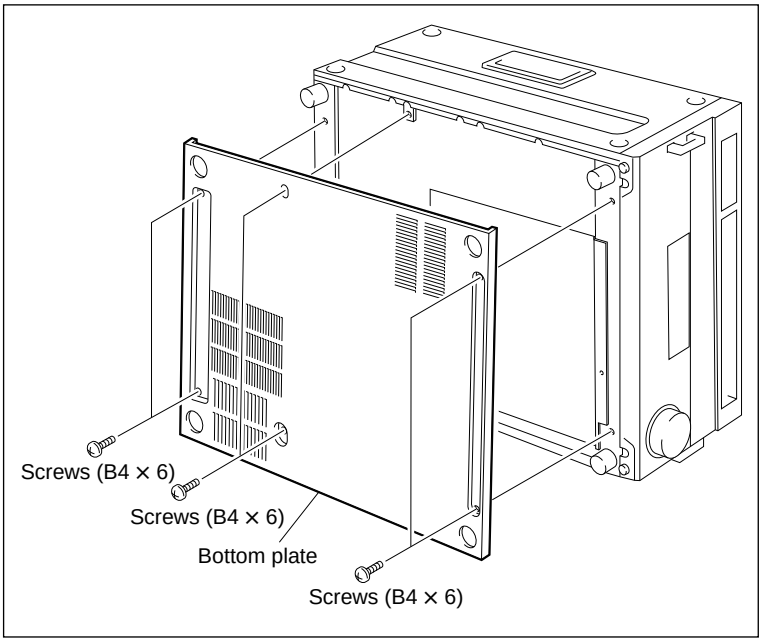
Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

16. Install the Bottom Plate

Tighten the bottom plate with six screws.



Install the Bottom Plate

Adjustment after Replacement

17. Confirm the Threading Motor Operation

Refer to Section 4-2 of the maintenance manual part 1.
(C012: THREADING MOTOR)

3-22. Threading Ring and Ring Roller Replacement

Outline

Replacement

1. Remove the Flexible Board (CN2/SE-461 Board)
2. Disconnect the Harness (AT Head Board)
3. Remove the Pinch Arm Guard
4. Remove the CL Guide Rail
5. Remove the Pinch Pressure Assembly
6. Remove the S Plate Assembly
7. Remove the S Tension Regulator Assembly
8. Disconnect the Harness (Demagnetization Head Assembly)
9. Remove the T Drawer Assembly
10. Remove the Gear Box Assembly (Refer to Procedures 1 through 5 in Section 3-21.)
11. Remove the Ring Roller
12. Remove the Threading Ring Assembly
13. Install the Ring Roller (A) and (C)
14. Cleaning (Threading Ring Assembly)
15. Install the Threading Ring Assembly
16. Install the Ring Roller (B)
17. Install the Gear Box Assembly (Refer to Procedures 11 through 17 in Section 3-21.)
18. Confirm the Threading Ring Operation
19. Install the S Plate Assembly
20. Install the Pinch Pressure Assembly
21. Put the Unit into the Unthreading End State.
22. Install the S Tension Regulator Assembly
23. Install the T Drawer Assembly
24. Confirm the T Drawer Assembly Operation
25. Install the CL Guide Rail
26. Confirm the CL Arm Assembly Operation
27. Install the Pinch Arm Guard
28. Connect the Flexible Board (CN2/SE-461 Board)
29. Connect the Harness (AT Head Board)
30. Connect the Harness (Demagnetization Head Assembly)
31. Pinch Pressure Clearance Adjustment (Refer to Section 3-11-2.)
32. Confirm the Tape Running (Refer to Section 4-1-2.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

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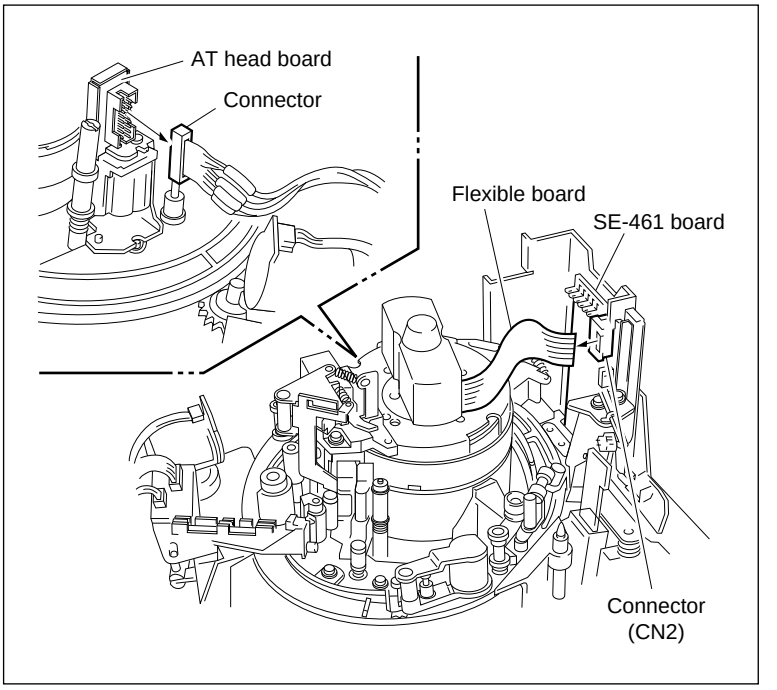
Removal

1. Remove the Flexible Board

Remove the flexible board from the connector CN2 on the SE-461 board.

2. Disconnect the Harness

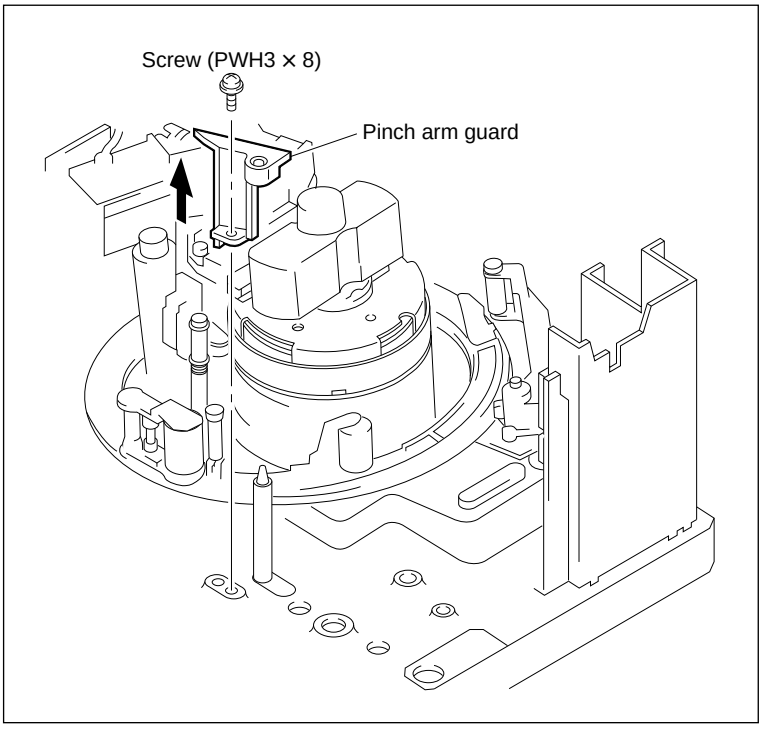
Disconnect the harness from the connector on the AT head board.



Remove the Flexible Board/Disconnect the Harness

3. Remove the Pinch Arm Guard

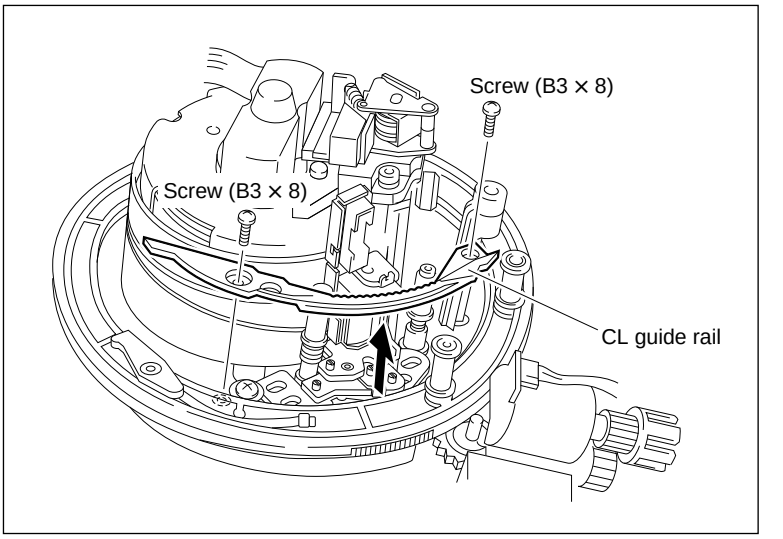
Remove the screw, then remove the pinch arm guard.



Remove the Pinch Arm Guard

4. Remove the CL Guide Rail

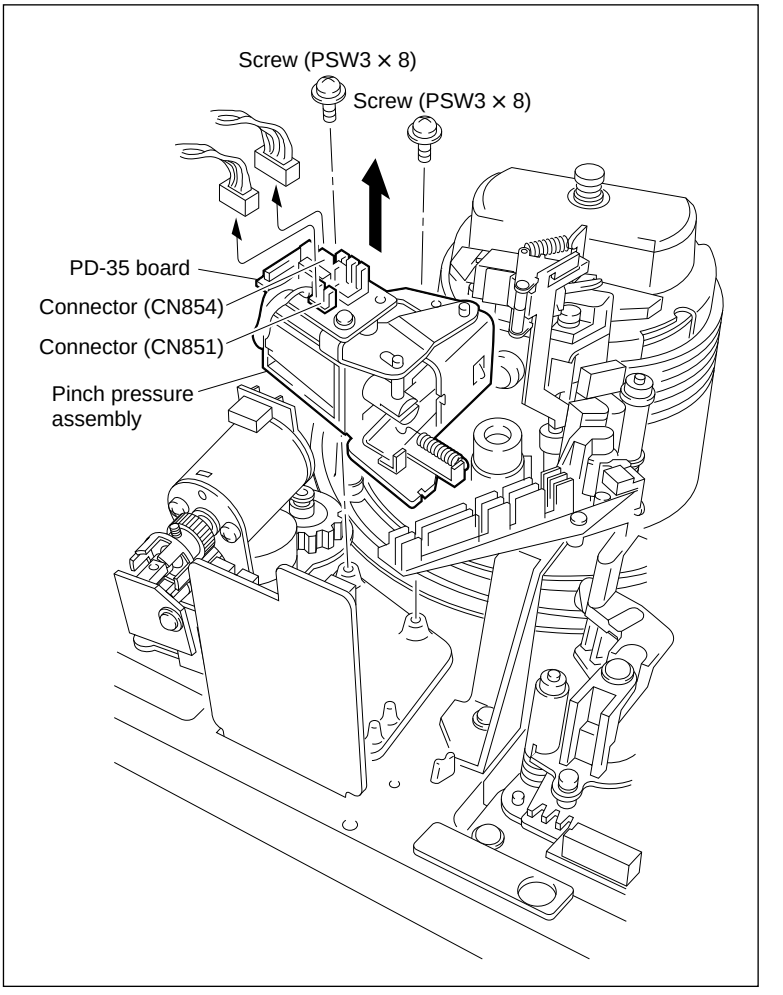
Remove the screws, then remove the CL guide rail.



Remove the CL Guide Rail

5. Remove the Pinch Pressure Assembly

(1) Disconnect the harness from the connector CN851 and CN854 on the PD-35 board.
(2) Remove the two screws, then remove the pinch pressure assembly.



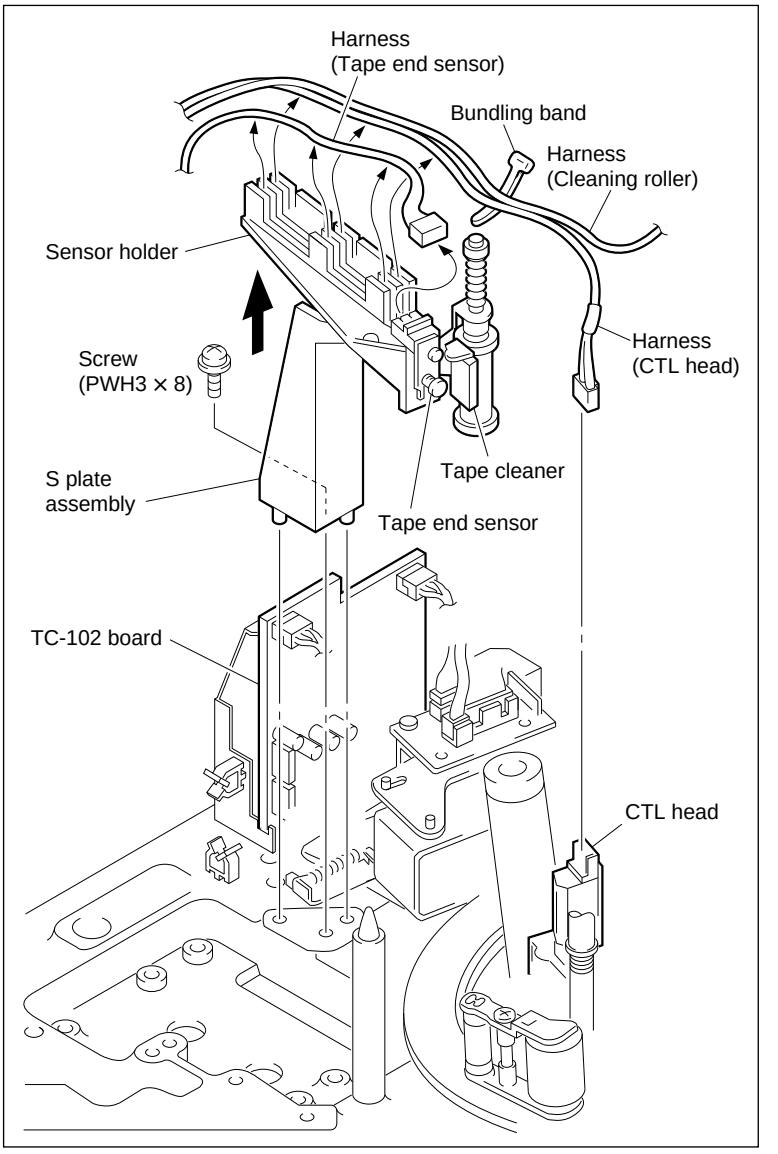
Remove the Pinch Pressure Assembly

6. Remove the S Plate Assembly

(1) Remove the bundling band and disconnect the harness from the connectors on the CTL head board and the tape end sensor board.
(2) Remove the harnesses (of the CTL head, cleaning roller and tape end sensor) from the groove of sensor holder.
(3) Remove the screw, then remove the S plate assembly.

Note

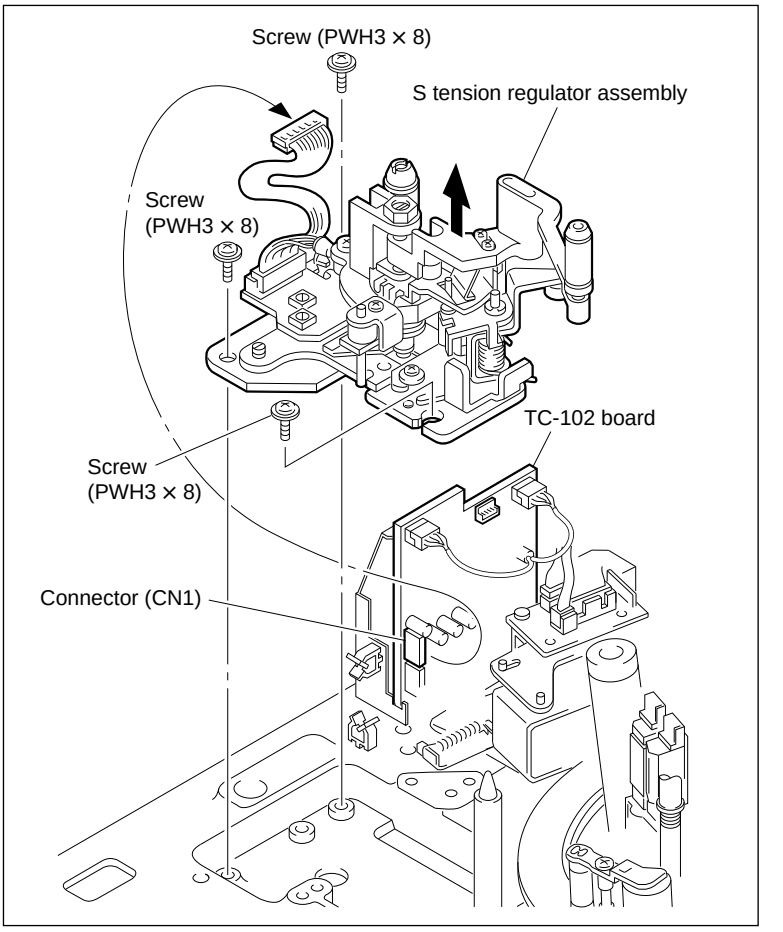
The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.



Remove the S Plate Assembly

7. Remove the S Tension Regulator Assembly

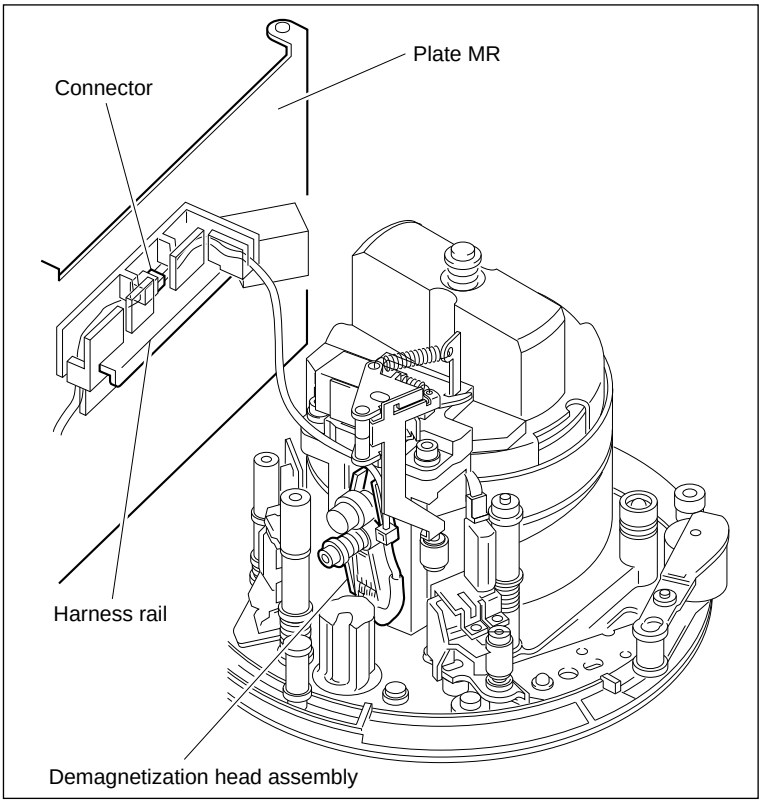
(1) Disconnect the harness from the connector CN1 on the TC-102 board.
(2) Remove the three screws, then remove the S tension regulator assembly.



Remove the S Tension Regulator Assembly

8. Disconnect the Harness

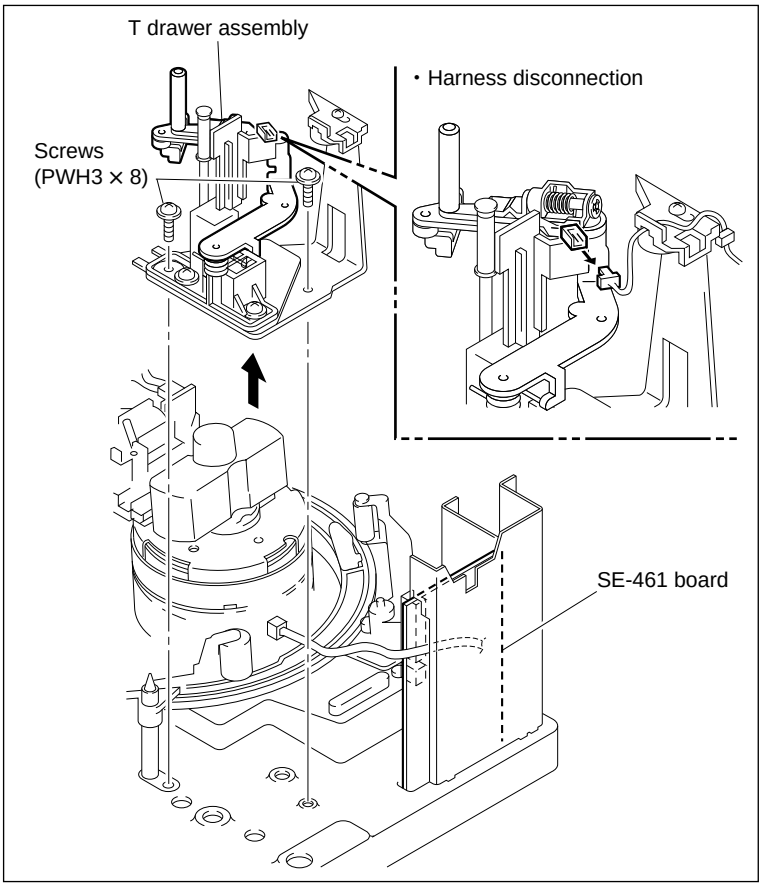
Disconnect the connector of demagnetization head assembly on the harness rail.



Disconnect the Harness

9. Remove the T Drawer Assembly

(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

10. Remove the Gear Box Assembly

Refer to procedures 1 through 5 in Section 3-21.

11. Remove the Ring Roller

(1) Remove the screws, then remove the ring rollers (A) and (B).

Note

Be careful not to touch the drum (especially, video heads).

(2) Move the threading ring in the direction indicated by the arrow.

(3) Remove the screw, then remove the ring roller (C).

Note

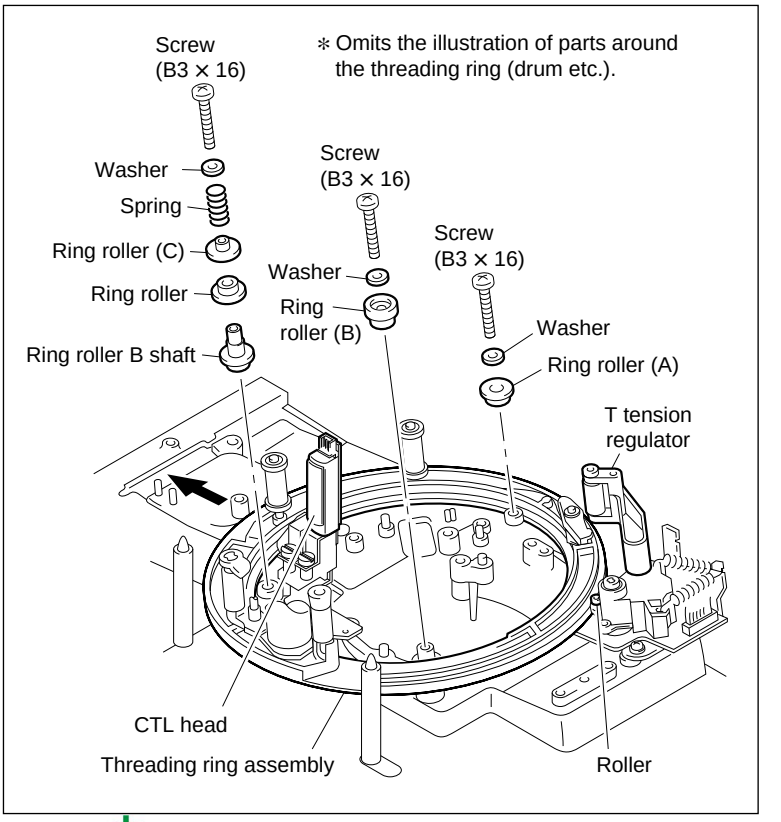
Be careful not to damage the CTL head.

12. Remove the Threading Ring Assembly

Remove the threading ring assembly from the chassis.

Note

Be careful not to damage the drum (especially, video heads or upper drum's tape running surface) and capstan motor shaft at that time.



Remove/Install the Ring Roller (C)

Installation

13. Install the Ring Roller (A) and (C)

(1) Assemble parts in the order shown in the figure of procedure 11 and install the ring rollers (A) and (C) in the chassis.

Note

Be careful not to damage the CTL head or full-erase head.

14. Cleaning

Clean the inside of a new threading ring assembly with cleaning cloth moistened with cleaning fluid.

15. Install the Threading Ring Assembly

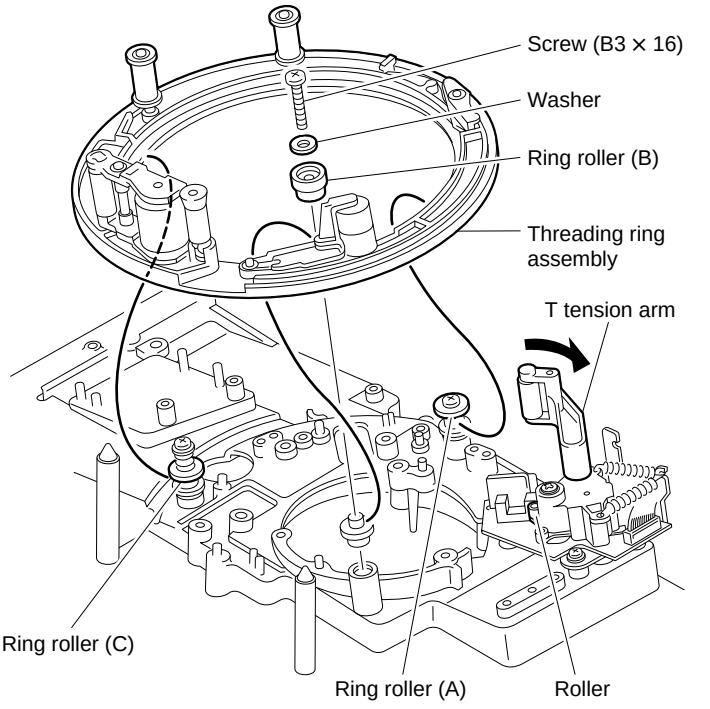
Push the T tension arm in the direction indicated by the arrow and install the threading ring assembly while putting it in the grooves of the ring rollers (A) and (C).

16. Install the Ring Roller (B)

(1) Pass the ring roller (B) through the roller shaft and tighten the screw while holding the threading ring assembly so that it is not dislocated from the grooves of the ring rollers (A) and (C).

(2) Confirm that the threading ring assembly is put between the three ring rollers. Moreover, confirm that the T tension regulator roller is not dislocated from the side of the threading ring.

∗ Omits the illustration of parts around the threading ring (drum etc.).



Install the Threading Ring Assembly

17. Install the Gear Box Assembly

Refer to procedures 11 through 17 in Section 3-21.

18. Comfirm the Threading Ring Operation

Turn the M gear of the gear box assembly for threading and unthreading directions, and confirm that the threading ring and three ring rollers rotate smoothly.

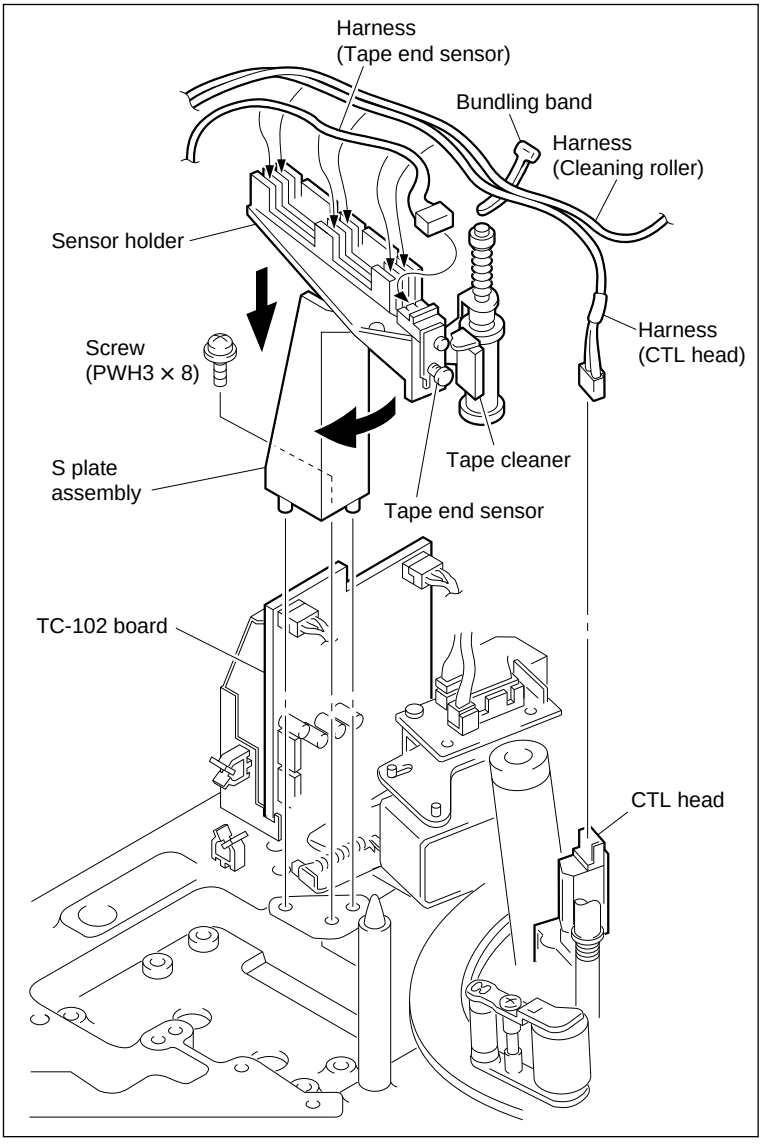
19. Install the S Plate Assembly

(1) Insert the pins of the S plate assembly into the holes of the chassis and tighten the screw while moving the S plate assembly clockwise.

Note

The tape cleaner has a sharp edge. Pay careful attention when handling the tape cleaner.

(2) Connect the harness to the connectors on the CTL head board and the tape end sensor board.
(3) Insert the harnesses (of the CTL head, cleaning roller and tape end sensor) into the groove of sensor holder.
(4) Fix the harness using a bundling band (or the equivalent).

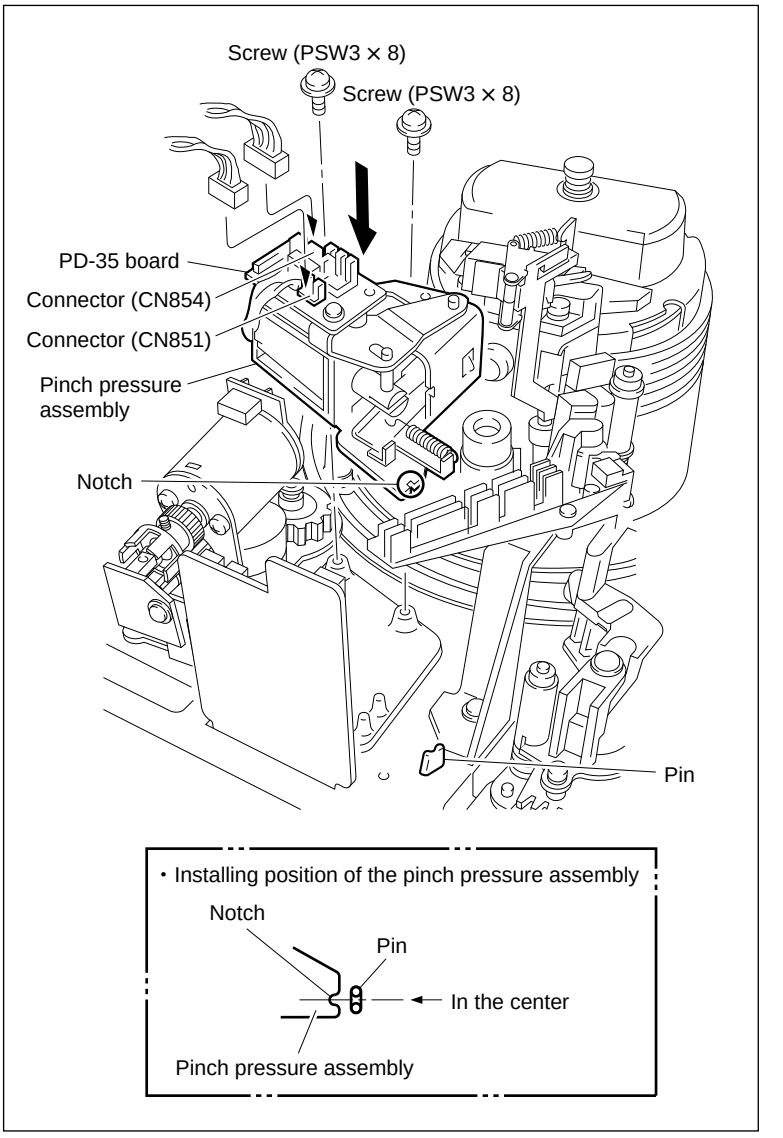


Install the S Plate Assembly

20. Install the Pinch Pressure Assembly

(1) Align the notch of the pinch pressure assembly with the center of the pin of the chassis, and tighten the two screws.

(2) Connect the harness to the connectors CN851 and CN854 on the PD-35 board.

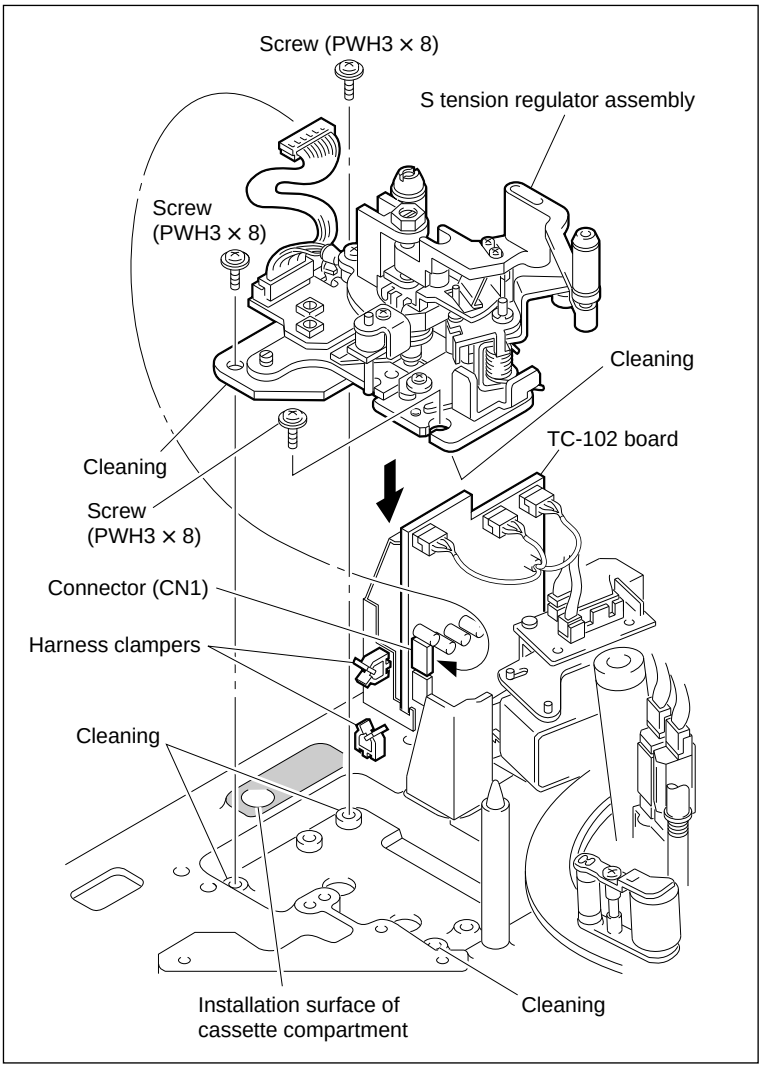


Install the Pinch Pressure Assembly

21. Put the Unit into the Unthreading End State.

22. Install the S Tension Regulator Assembly

(1) Clean the installation surfaces of the S tension regulator assembly and chassis in the three portions.
(2) Set the S tension regulator assembly and tighten with the three screws.
(3) Connect the harness into the connector CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the installation surface (portion in the figure) of the cassette compartment.



Install the S Tension Regulator Assembly

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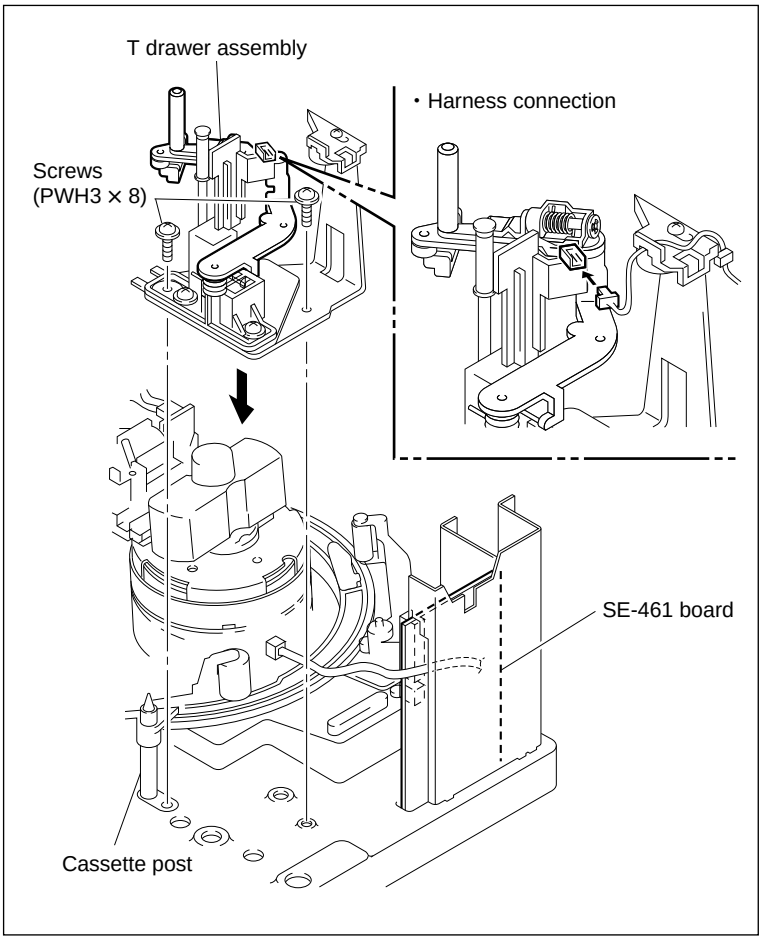
23. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten with the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Install the T Drawer Assembly

24. Confirm the T Drawer Assembly Operation

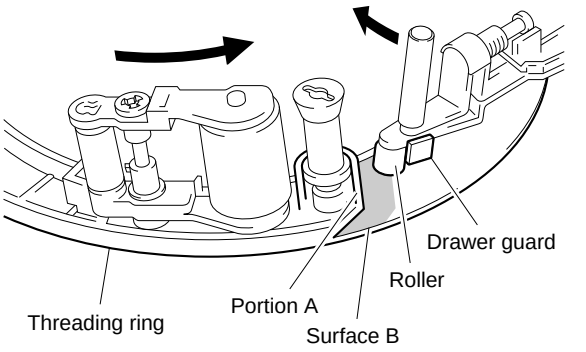
(1) Confirm that portion A of the threading ring is pushing the roller and drawer guide of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 1)

If specification 1 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 in Section 3-25-1.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 2)

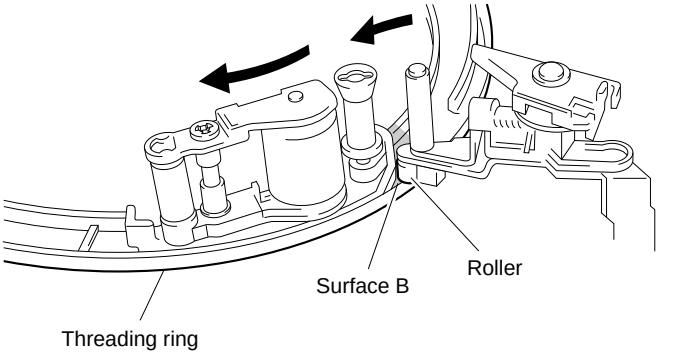
If specification 2 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9 in Section 3-25-1.)

・Threading



Spec. 1 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Unthreading

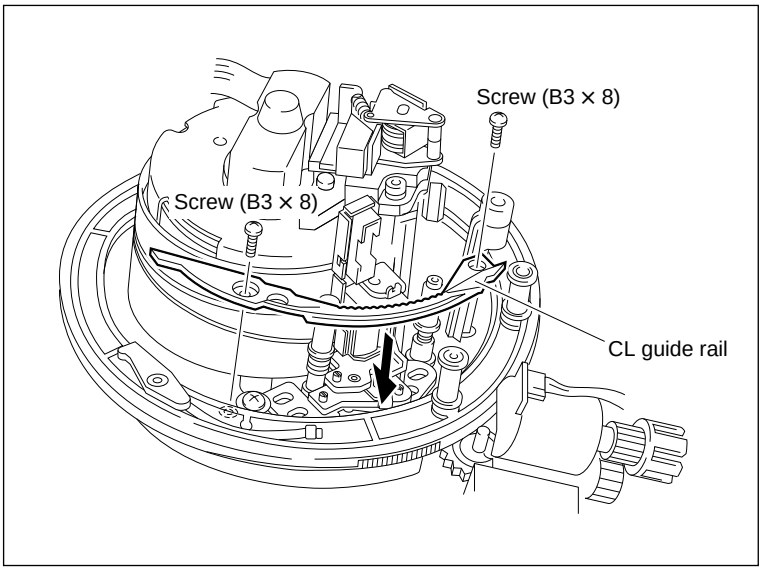


Spec. 2 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confirm the T Drawer Assembly Operation

25. Install the CL Guide Rail

Install the CL guide rail with two screws.

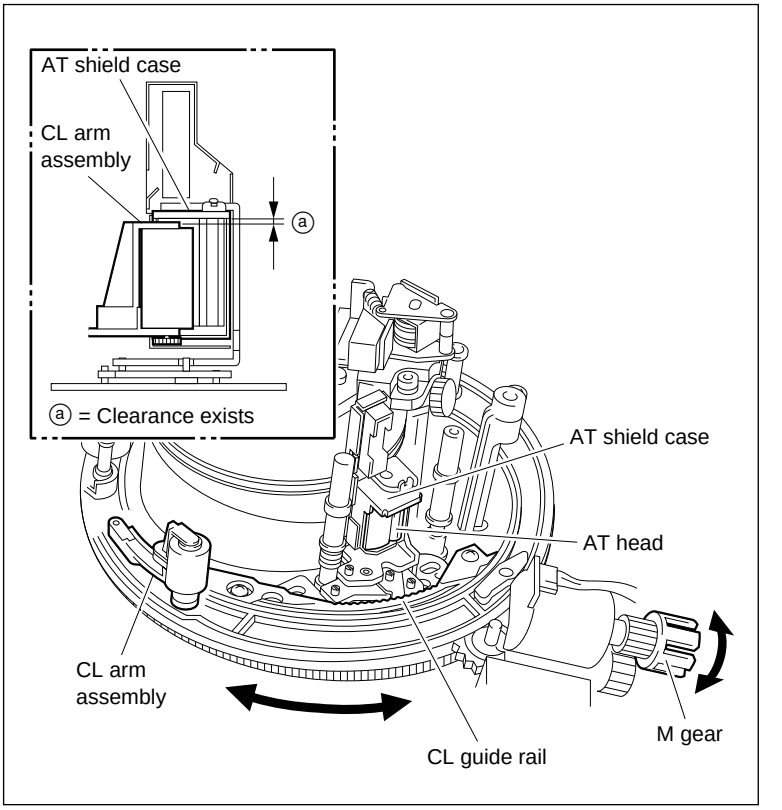


Install the CL Guide Rail

26. Confirm the CL Arm Assembly Operation

Turn the M gear of the gear box assembly and confirm the following items while repeating the threading and unthreading.

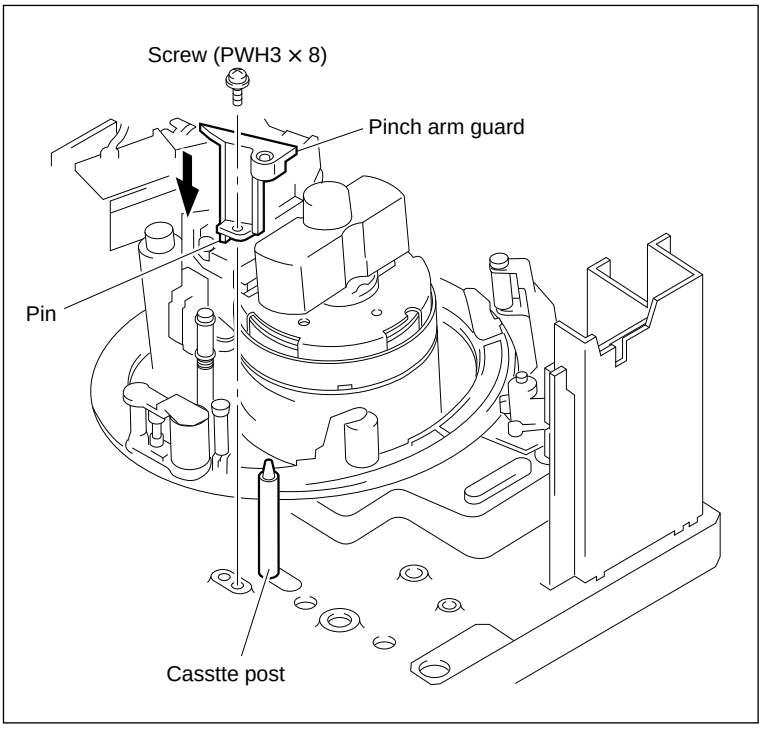
- The CL arm assembly moves along the CL guide rail.
- The cleaning roller cleans the AT head.
- A clearance exists between the top of the CL arm assembly and the AT shield case when the cleaning roller cleans the AT head.



Confiirm the CL Arm Assembly Operation

27. Install the Pinch Arm Guard

(1) Pass the pinch arm guard through the cassette post and put the pin into the chassis hole.
(2) Tighten the screw.



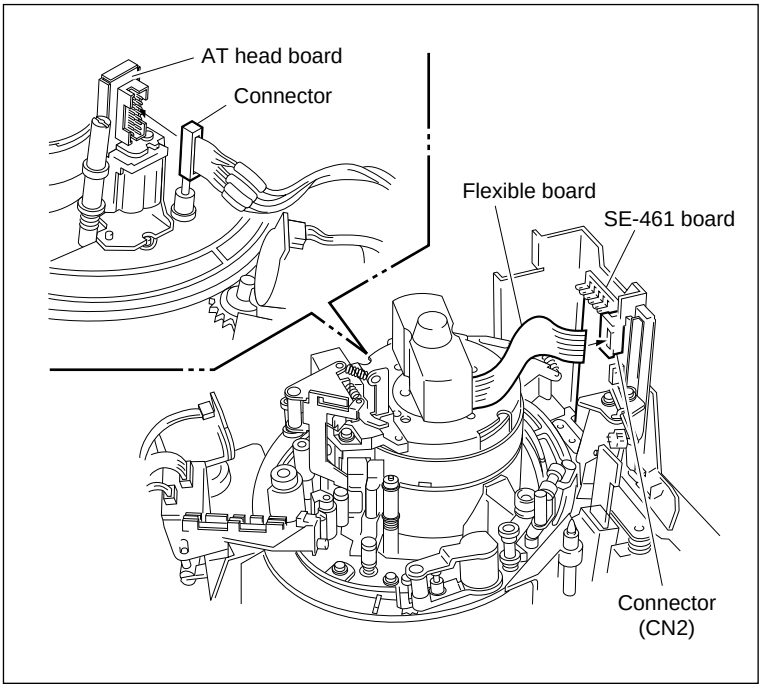
Install the Pinch Arm Guard

28. Connect the Flexible Board

Connect the flexible board to connector CN2 on the SE-341 board, then lock.

29. Connect the Harness

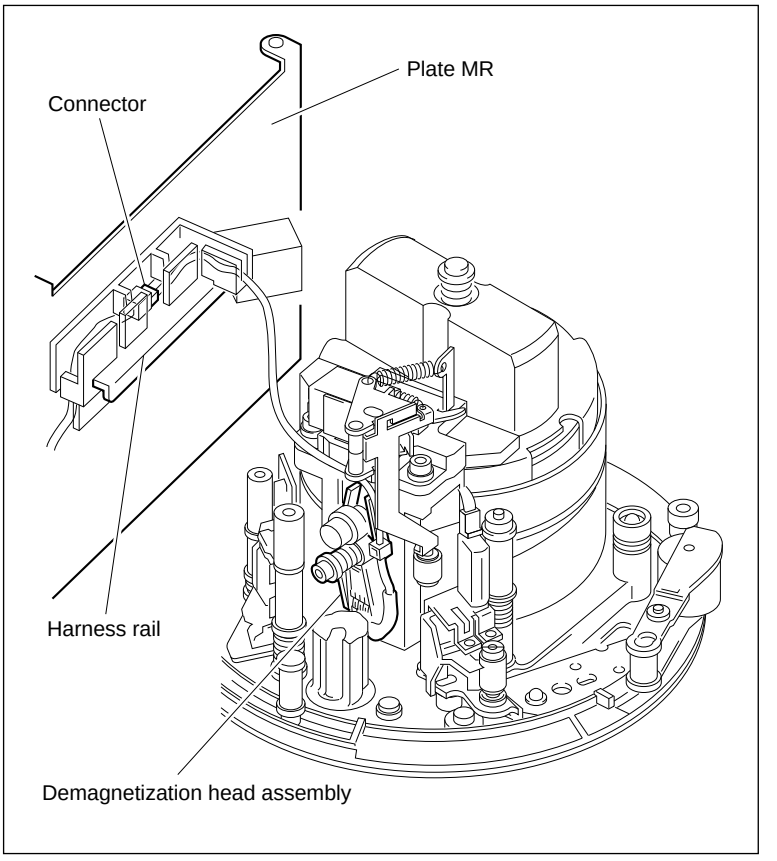
Connect the harness to the connector of the AT head board.



Connect the Flexible Board/Harness

30. Connect the Harness

Connect the connector of demagnetization head assembly on the harness rail.



Connect the Harness

Adjustment after Replacement

31. Pinch Pressure Clearance Adjustment

Refer to Section 3-11-2.

32. Confirm the Tape Running

Refer to Section 4-1-2.

3-23. S Tention Regulator Assembry Replacement

Outline

Replacement

1. Put the Unit into the Unthreading End State
2. Remove the S Tension Regulator Assembly
3. Install the S Tension Regulator Assembly

Adjustment after Replacement

4. Tape Running Adjustment (Refer to Section 4-1-2.)
5. Tension Offset Adjustment
   (Refer to Section 4-2 of the maintenance manual part 1.)
   (A008: S/T TENSION OFFSET)

Note

The replacement of the component part on the S tension regulator assembly requires a precise adjustment. Therefore, replace the whole assembly (A-8267-795-E).

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Removal

1. Put the Unit into the Unthreading End State

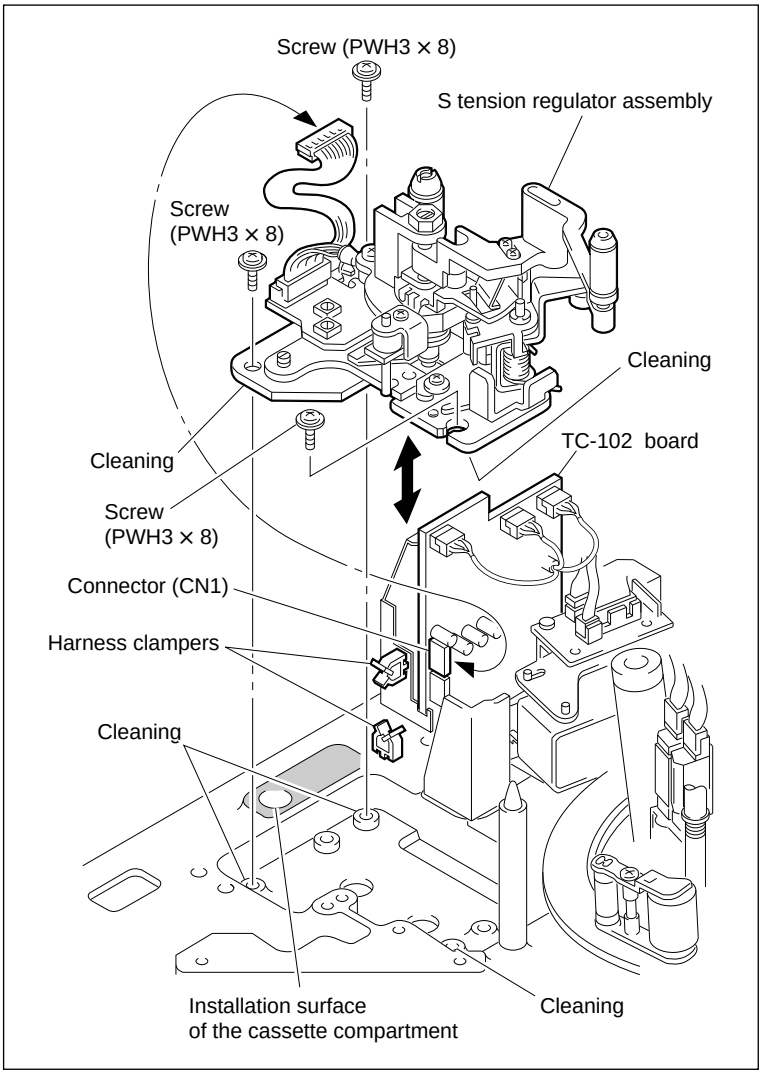
2. Remove the S Tension Regulator Assembly

(1) Disconnect the harness from the connector CN1 on the TC-102 board.
(2) Remove the three screws, then remove the S tension regulator assembly.

Installation

3. Install the S Tension Regulator Assembly

(1) Clean the installation surface of the S tension regulator assembly and chassis in three portions.
(2) Set the S tension regulator assembly and tighten the three screws.
(3) Connect the connector to CN1 on the TC-102 board.
(4) Put the harness in the harness clamper.
(5) Confirm that the harness does not protrude into the installation surface (portion in the figure) of the cassette compartment.



Remove/Install the S Tension Regulator Assembly

Adjustment after Replacement

4. Tape Running Adjustment

Refer to Section 4-1-2.

5. Tension Offset Adjustment

Refer to Section 4-2 of the maintenance manual part 1.
(A008: S/T TENSION OFFSET)

3-24. T Tention Arm Replacement

Outline

Replacement

1. Remove the Tension Spring (on the T Tension Base Side)
2. Remove the T Tension Arm
3. Remove the Yoke Plate
4. Install the Yoke Plate
5. Install the T Tension Arm
6. Install the Tension Spring (on the T Tension Base Side)
7. Confirm the T Tension Regulator Operation

Adjustment after Replacement

8. Tension Offset Adjustment
   (Refer to Section 4-2 of the maintenance manual part 1.)
   (A008: S/T TENSION OFFSET)

Notes

- This section explains the replacement procedures of the T tension arm.
  When replacing whole of the T tension assembly, refer to exploded views of the maintenance manual part 2 volume 2.
  The T tension assembly supplied as repair parts differs in the harness length from one used in this unit because of standardization of repair parts. When replacing the T tension assembly, replace the harness by one used in this unit.
- Use a new stop washer when the T tension arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

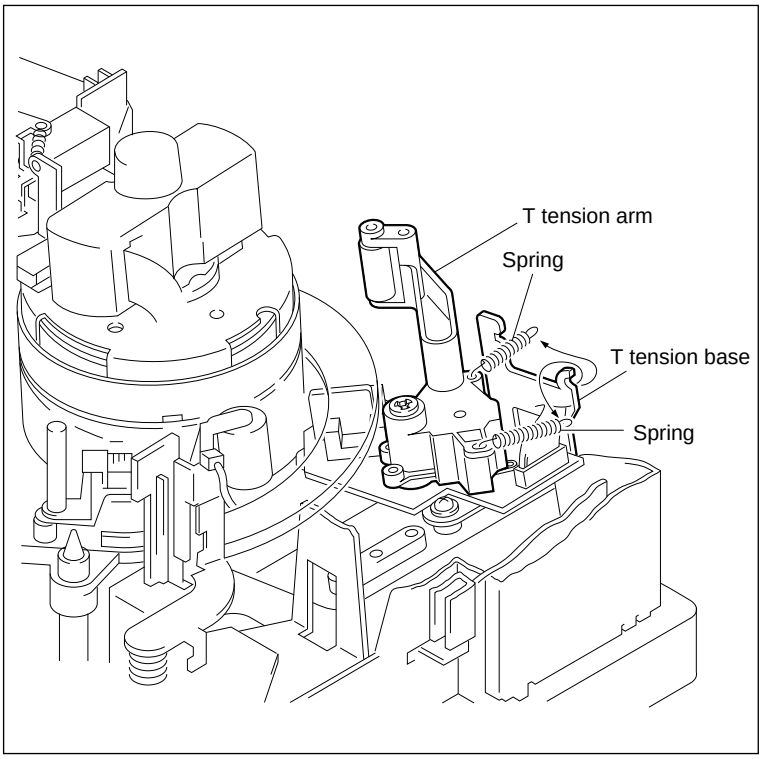
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01

Removal

1. Remove the Tension Spring

Remove the two springs caught on the T tension base.



Remove the Tension Spring

2. Remove the T Tension Arm

(1) Remove the stop washer, then remove the T tension arm.

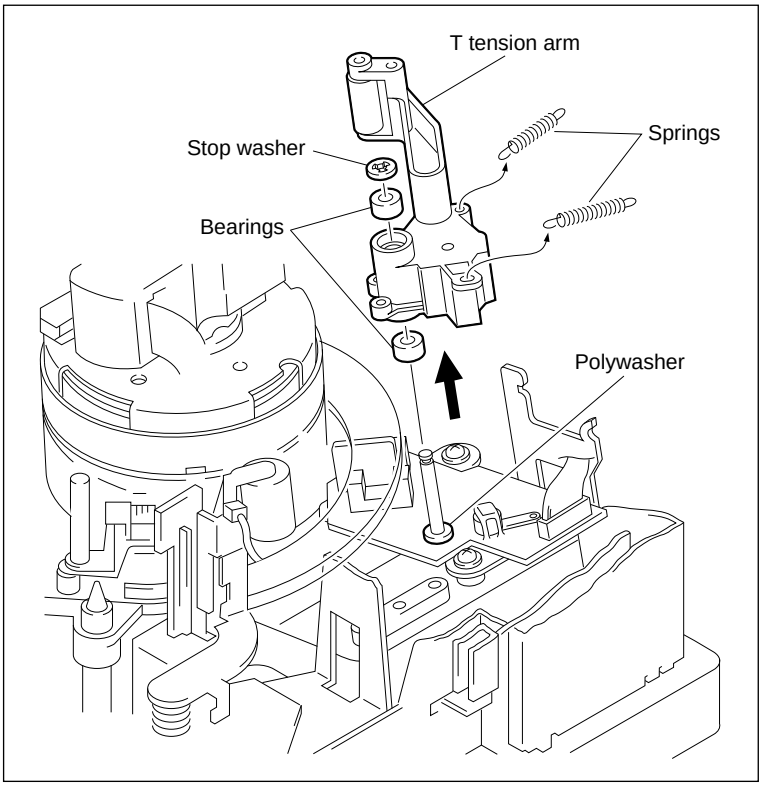
Notes

- Do not reuse the stop washer.
- A polywasher may be attached together when the T tension arm is removed. In this case, remove the polywasher from the T tension arm and return it to the shaft.

(2) Remove the two bearings and two springs from the T tension arm.

Note

The two springs are the same.



Remove the T Tension Arm

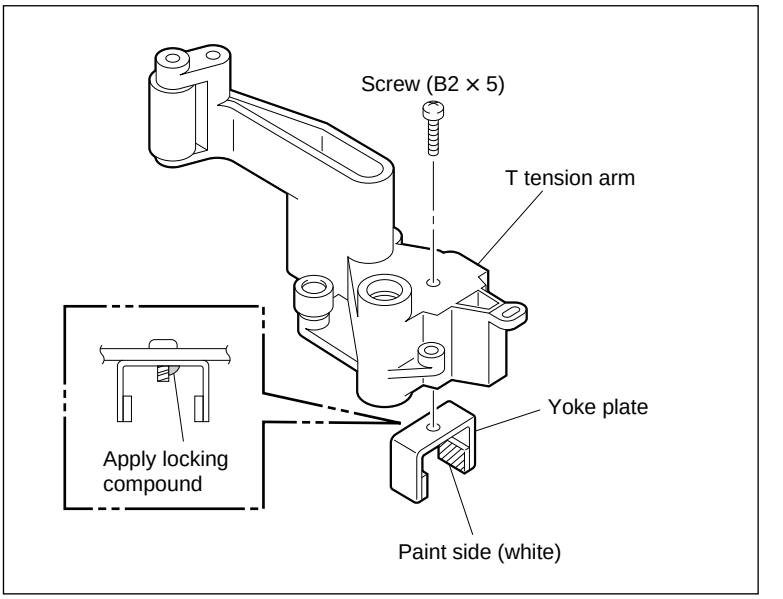
3. Remove the Yoke Plate

Remove the screw, then remove the yoke plate from the T tension arm.

Installation

4. Install the Yoke Plate

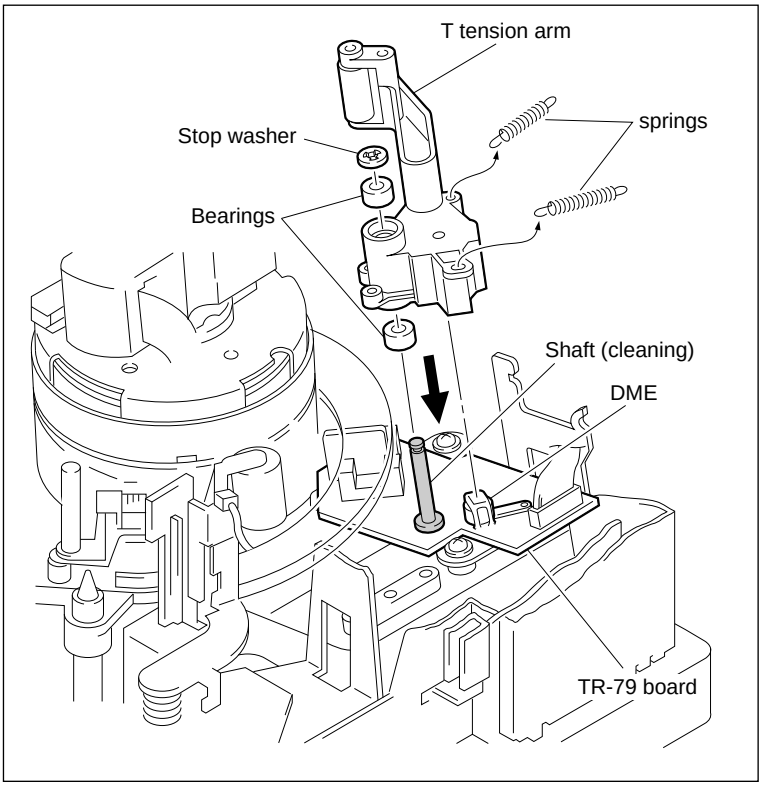
(1) Put the yoke plate in the direction shown in the figure and tighten the screw.
(2) Apply locking compound slightly to the yoke plate.



Remove/Install the Yoke Plate

5. Install the T Tension Arm

(1) Clean the shaft.
(2) Insert the bearing into the T tension arm.
(3) Put the two springs on the T tension arm as shown in the figure.
(4) Pass the T tension arm through the shaft while putting DME on the TR-79 board in the T tension arm.
(5) Fix the T tension arm using a new stop washer.



Install the T Tension Arm

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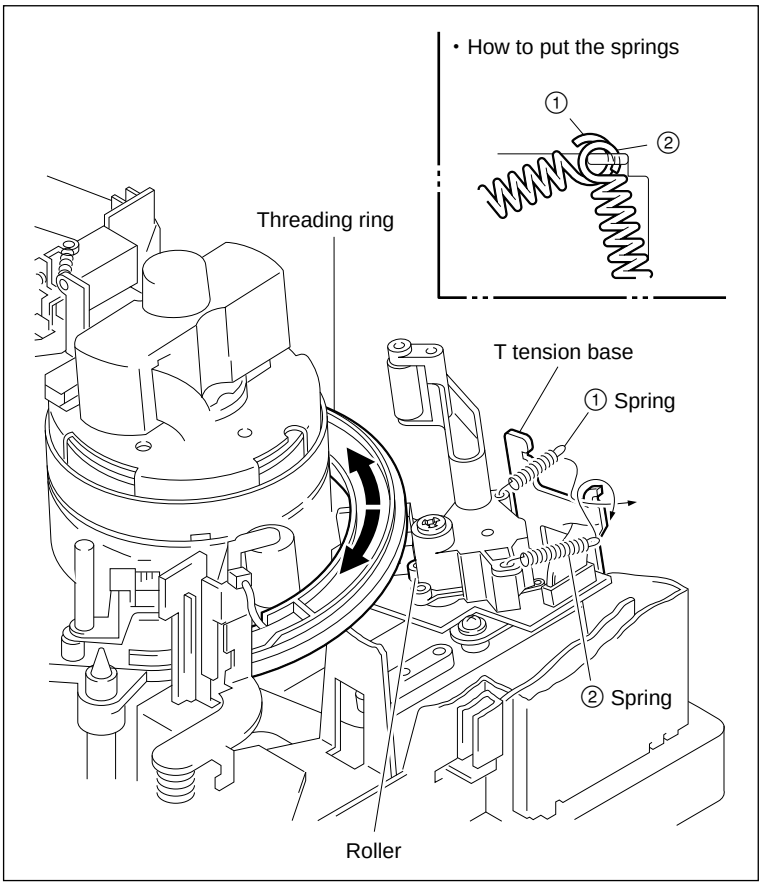
6. Install the Tension Spring

Put the two springs removed in (2) of step 2 on the T tension base in the order of ① and ② in the direction shown in the figure.

7. Confirm the T Tension Regulator Operation

Put the threading ring into the threading/ unthreading state and confirm that the T tension regulator roller is not dislocated from the threading ring and operates normally.



Install the Tension Spring

Adjustment after Replacement

8. Tension Offset Adjustment

(Refer to Section 4-2 of the maintenance manual part 1.)
(A008: S/T TENSION OFFSET)

3-25. T Drawer Arm Replacement

3-25-1. T Drawer Arm Replacement

Outline

Replacement

1. Remove the T Drawer Assembly
2. Remove the T Drawer Arm
3. Remove the Slant Guide
4. Remove the Slant Guide Base
5. Remove the Drawer Guide
6. Install the Drawer Guide
7. Install the Slant Guide Base
8. Install the Slant Guide
9. Install the T Drawer Arm
10. Install the T Drawer Assembly
11. Confirm the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment (Refer to Section 3-25-2.)

Notes

- The slant guide, slant guide base, and drawer guard can be replaced in the same procedure as described in this section.
- Use a new stop washer when the T drawer arm is replaced.
  Stop washer (2.3): 3-669-596-00

Preparation

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part1.)
4. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part1.)
5. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part1.)

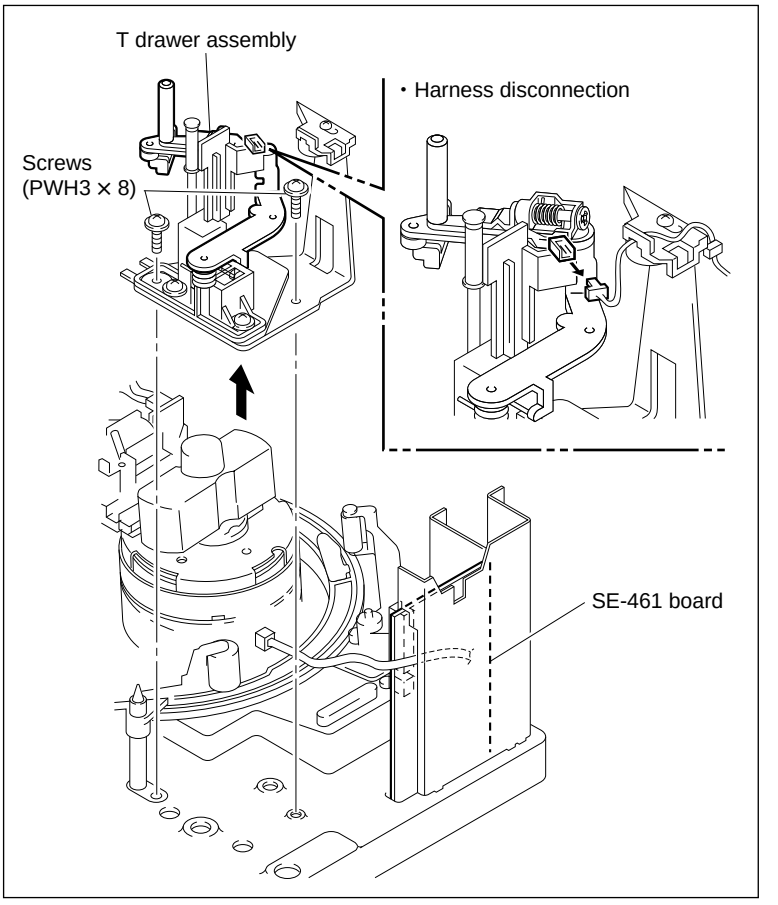
Tools

- Locking compound: 7-432-114-11
- Cleaning fluid: 9-919-573-01
- Cleaning cloth: 3-184-527-01
- Calipers (or the equivalent)

Removal

1. Remove the T Drawer Assembly

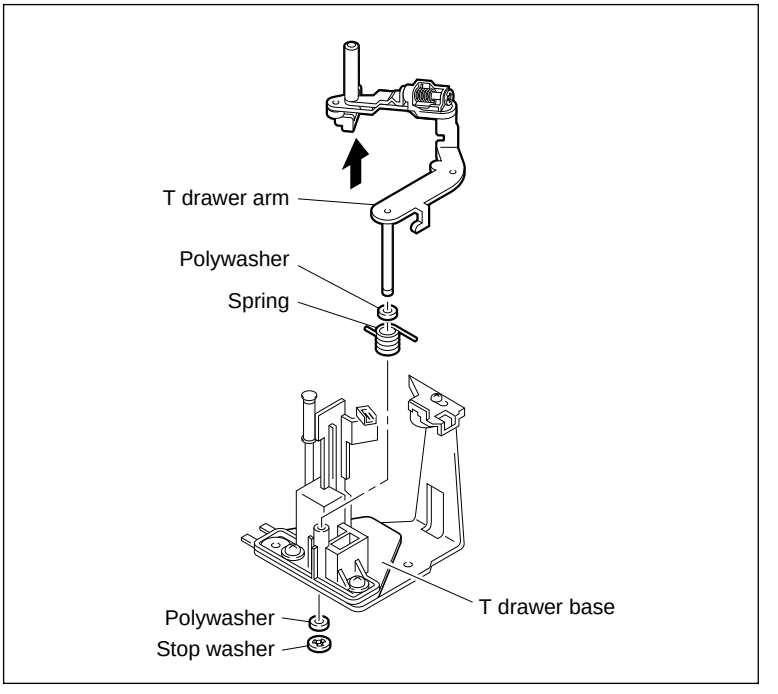
(1) Disconnect the harness from the connector of the tape top sensor.
(2) Remove the two screws, then remove the T drawer assembly.



Remove the T Drawer Assembly

2. Remove the T Drawer Arm

(1) Remove the stop washer and polywasher, then remove the T drawer arm from the T drawer base.
(2) Remove the spring and polywasher.



Remove the T Drawer Arm

3. Remove the Slant Guide
Remove the stop washer, then remove the slant guide and spring from the T drawer arm.

4. Remove the Slant Guide Base
Remove the screw, then remove the slant guide base from the T drawer arm.

5. Remove the Drawer Guard
Remove the screw, then remove the drawer guard from the T drawer arm.

Installation

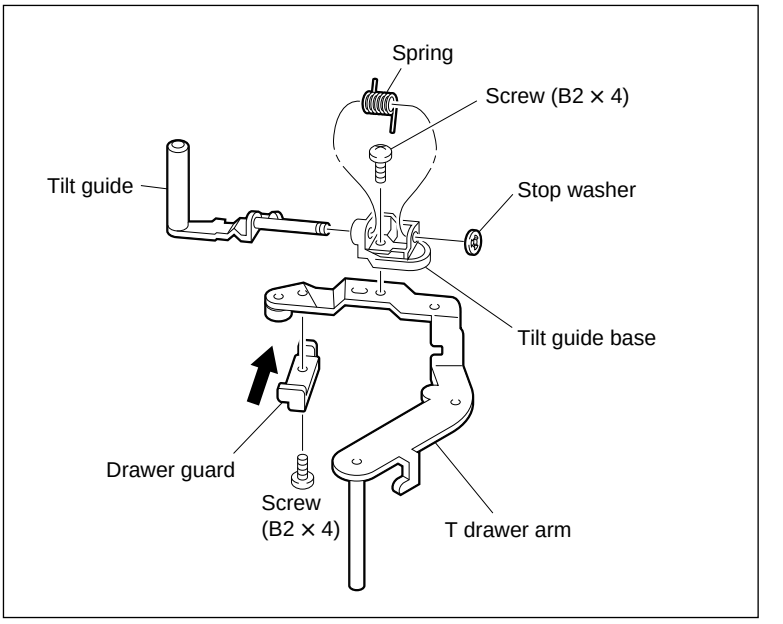
6. Install the Drawer Guard
(1) Push the drawer guard in the direction indicated by the arrow and tighten the screw.
(2) Apply locking compound to the screw.

7. Install the Slant Guide Base
(1) Move the slant guide base counterclockwise and tighten the screw.
(2) Apply locking compound to the screw.

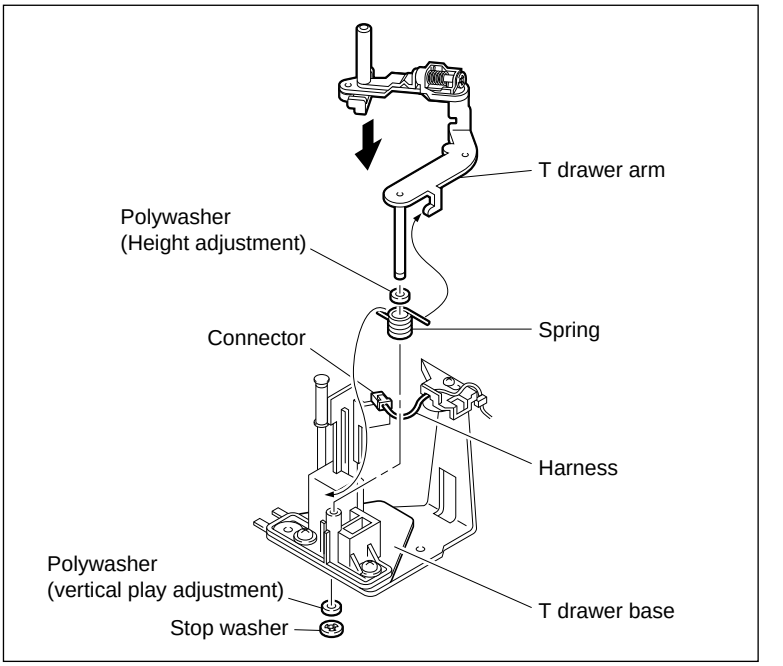
8. Install the Slant Guide
(1) Pass the spring through the Slant guide base while passing it through the slant guide shaft.
(2) Put the spring on the slant guide base.
(3) Fix the slant guide using a new stop washer.

9. Install the T Drawer Arm
(1) Pass the polywasher and spring through the T drawer base while passing them through the shaft of the T drawer arm assembly.
(2) Put the spring on the T drawer arm and T drawer base.
(3) Confirm that specification 1 is satisfied with the T drawer arm pushed downward.

If specification 1 is not satisfied, perform the following adjustment. (Height adjustment)
① Remove the T drawer arm and spring.
② Adjust the polywasher value at the top of the T drawer base.
③ Confirm that specification 1 is satisfied.



T Drawer Arm Disassemble/Assemble



Install the T Drawer Arm

(4) Pass the polywasher through the shaft and fix the T drawer arm using a new stop washer.
(5) Move the T drawer arm manually in the vertical direction. At that time, confirm that the vertical play satisfies specification 2.

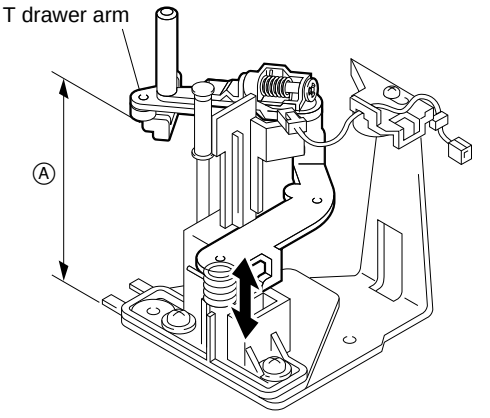
If specification 2 is not satisfied, perform the following adjustment. (Vertical play adjustment)
① Remove the stop washer.
② Adjust the polywasher value at the bottom of the T drawer base.
③ Fix the T drawer arm using a new stop washer and confirm that specification 2 is satisfied.

(6) Confirm that the height of the T drawer arm satisfies the specification 3 with the T drawer arm turned to clockwise by finger.
If specification 3 is not satisfied, perform the procedures (3) and later again.

Note

Some of the T drawer assemblies have no arm stopper. In these cases, the confirmation described above, step 6, is not required.

・T drawer arm height adjustment/vertical play adjustment



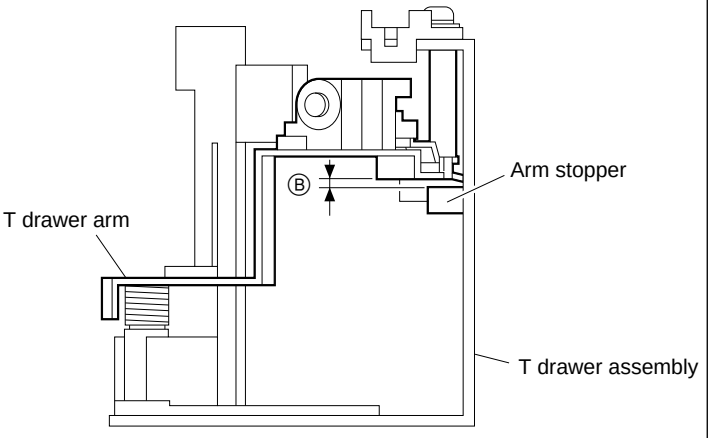
Spec. 1 : (height)
Ⓐ = 36.3 mm to 36.7 mm
Spec. 2 : (vertical play)
0.2 mm or less

・Spec. 1 and 2 are not satisfied.

・Polywasher to adjustment

diameter	thickness	Part No.
3.0 mm	0.13 mm	3-701-439-01
	0.25 mm	3-701-439-11
	0.5 mm	3-701-439-21

< Side view >

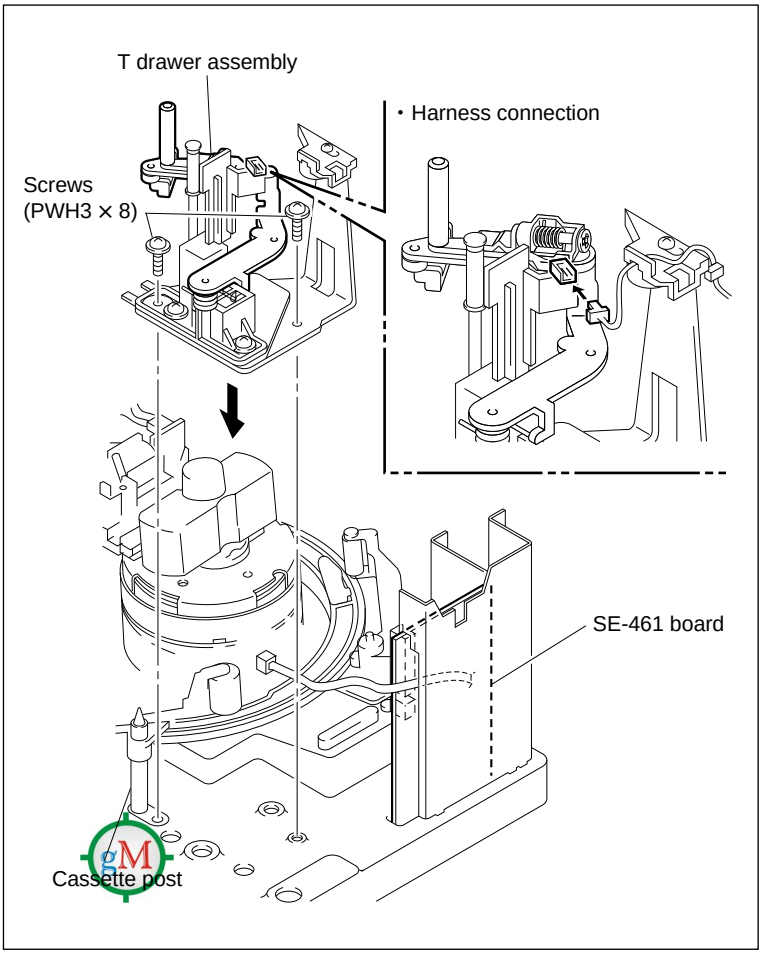


Spec. 3 : Ⓑ ≧ 0.2 mm
(Between arm stopper and arm)

Install the T Drawer Arm

10. Install the T Drawer Assembly

(1) Clean the installation surface of the T drawer assembly and chassis.
(2) Set the T drawer assembly and tighten the two screws.
(3) Connect the harness to the connector of the tape top sensor.
(4) Fix the harness to the holder of the adjustment plate.



Install the T Drawer Assembly

11. Confirm the T Drawer Assembly Operation

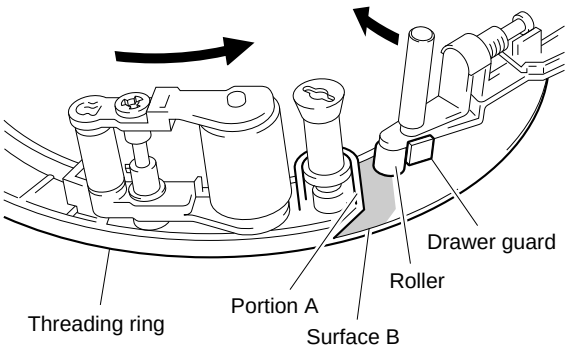
(1) Confirm that portion A of the threading ring is pushing the roller and drawer guard of the T drawer assembly securely during threading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 4)

If specification 4 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)

(2) Confirm that the roller of the T drawer assembly smoothly moves along the inside of the threading ring during unthreading. Moreover, confirm that the lower surface of the roller does not touch with the surface B (portion in the figure) of the threading ring at that time. (Specification 5)

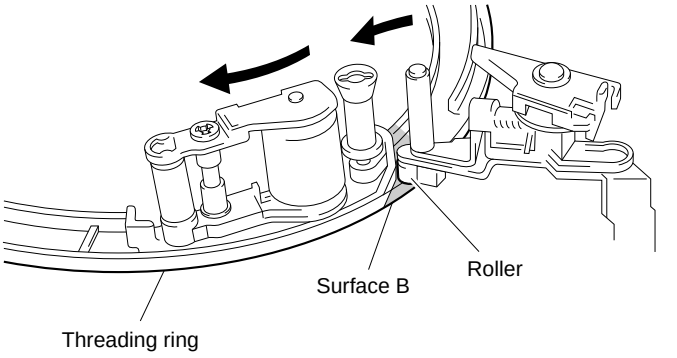
If specification 5 is not satisfied, adjust the height and vertical play of the T drawer arm. (Refer to procedure 9.)

・Threading



Spec. 4 : At the threading state, the lower surface of the roller does not touch with the surface B of the threading ring.

・Untherading



Spec. 5 : At the unthreading state, the lower surface of the roller does not touch with the surface B of the threading ring.

Confim the T Drawer Assembly Operation

Adjustment after Replacement

12. Slant Guide Slantness Adjustment

Refer to Section 3-25-2.

3-25-2. Slant Guide Slantness Adjustment

Note

Be sure to perform this adjustment when the T drawer arm and slant guide are replaced.

Tools

- Cassette reference plate (L)(MW-088): J-6320-880-A
- Tension regulator verticality check tool (BW-080): J-6190-800-A
- Thickness gauge: 9-911-053-00
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Locking compound: 7-432-114-11
- Metal cassette tape for Betacam SP (L cassette)

Confirmation

1. Install the Cassette Reference Plate (L)

Put the cassette reference plate (L) in the direction shown in the figure and align it with the two cassette posts.

2. Confirm the Slant Guide Slantness

(1) Press the check tool against the slant guide from the directions indicated by arrows A and B.

(2) Confirm that the clearance between the slant guide and tool satisfies specifications 1 and 2.

If specifications 1 and 2 are not satisfied, repeat procedures ① and ② below until they are satisfied.

① Bend the slant guide so that specifications 1 and 2 are satisfied.

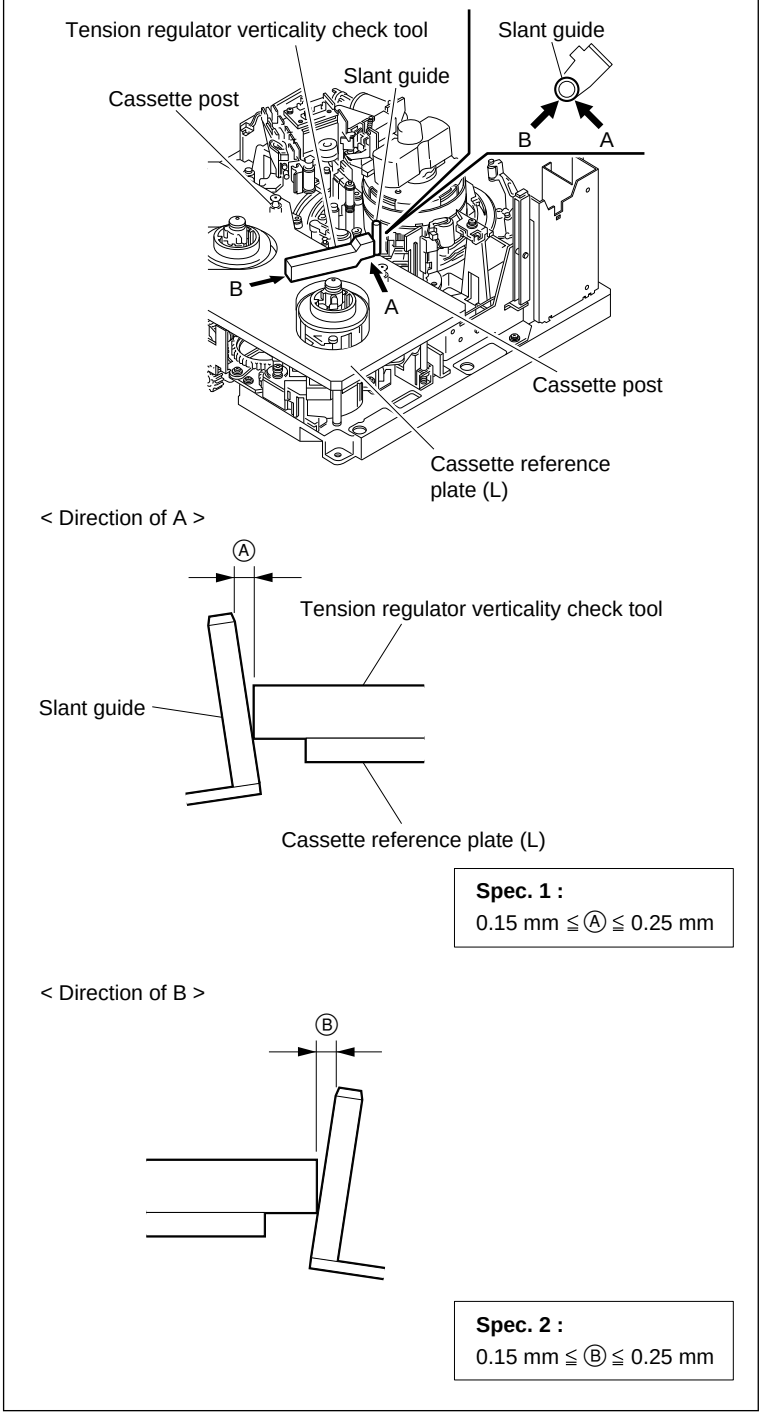
② Repeat the threading/unthreading and reconfirm that specifications 1 and 2 are satisfied.

3. Remove the Cassette Reference Plate

Remove the tension regulator verticality check tool and cassette reference plate (L).

4. Cleaning

Clean the slant guide with cleaning cloth moistened with cleaning fluid.



Confirm the Slant Guide Slantness

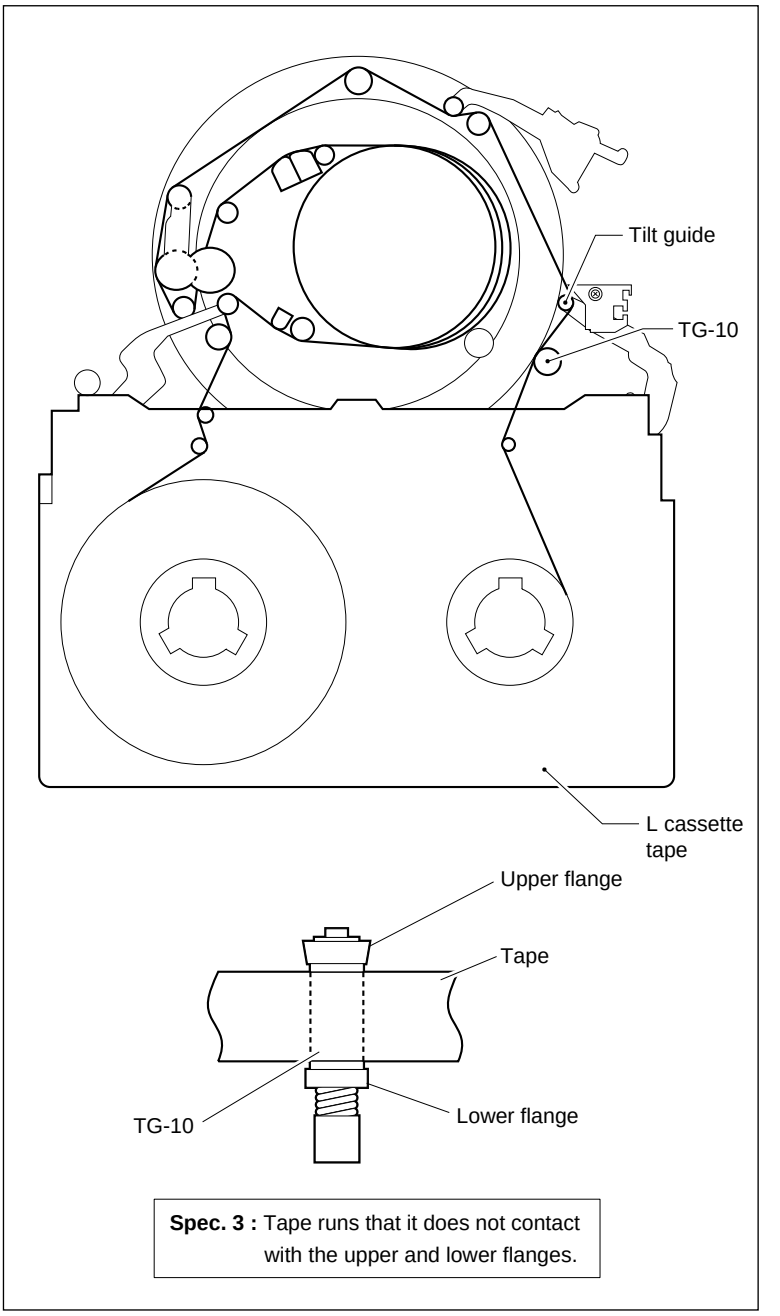
5. Set the L Cassette Tape

(1) Put the RS table block assembly into the L cassette position.
(2) Set the L cassette tape and put a weight so that the cassette is stable.
Weight about 1,000 g is suitable.

6. Tape Running Confirmation at TG-10 Guide

(1) Put the unit into the F.FWD mode, then put it into the PLAY mode after approximately three seconds.
(2) Confirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, perform the adjustments in procedures 7 and later.



Tape Running Confirmation at TG-10 Guide

http://getMANUAL.com

Adjustment

7. Loosen the Screw

Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.

8. Slant Guide Slantness Adjustment

(1) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the position of the adjustment plate so that specification 3 is satisfied.

- When the tape touches with the upper flange: Move the adjustment plate in the direction indicated by arrow A.
- When the tape touches with the lower flange: Move the adjustment plate in the direction indicated by arrow B.

9. Tighten the Screw

Tighten the screw loosened in procedure 7.

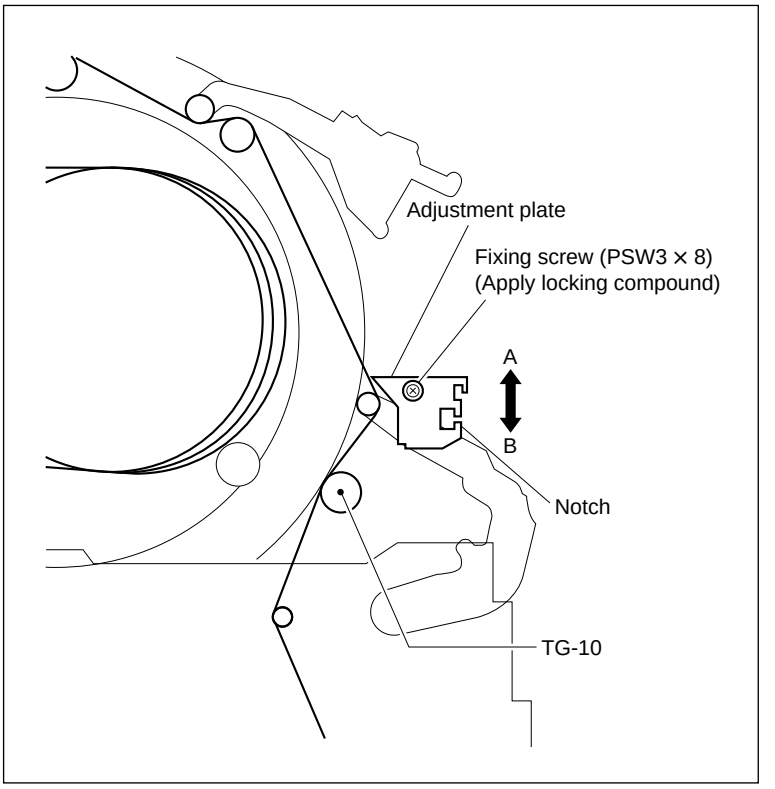
10. Tape Running Reconfirmation at TG-10 Guide

(1) Put the unit into the unthreading end mode.
(2) Put the unit into the PLAY mode again, and reconfirm that the tape runs at the TG-10 guide with specification 3 is satisfied state.

If specification 3 is not satisfied, repeat procedures 7 through 10.

11. Apply Locking Compound

Apply the locking compound to the securing screw of the adjustment plate.



Slant Guide Slantness Adjustment

3-26. Cassette Compartment Motor Replacement

Outline

Replacement

1. Disconnect the Harness (CN935/CL-29 Board)
2. Remove the Warm
3. Remove the Cassette Compartment Motor
4. Remove the Motor Joint
5. Remove the Spacer and Disconnect the Harness
6. Harness Soldering
7. Install the Motor Joint
8. Install the Spacer and Warm
9. Install the Cassette Compartment Motor
10. Grease Smearing
11. Connect the Harness (CN935/CL-29 Board)

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation (Refer to Section 4-2 of the maintenance manual part 1.)
    (C013: CASSETTE COMP.)

Preparation

1. Turn off the power.
2. Remove the upper lid. (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the plate MD assembly. (Refer to Section 2-4 of the maintenance manual part 1.)
4. Remove the cassette compartment assembly. (Refer to Section 2-5 of the maintenance manual part 1.)

Tools

- L wrench (Across flat has 0.89 mm): 7-700-736-06
- Grease (SGL-601): 7-651-000-10
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Calipers (or the equivalent)

Removal

1. Disconnect the Harness

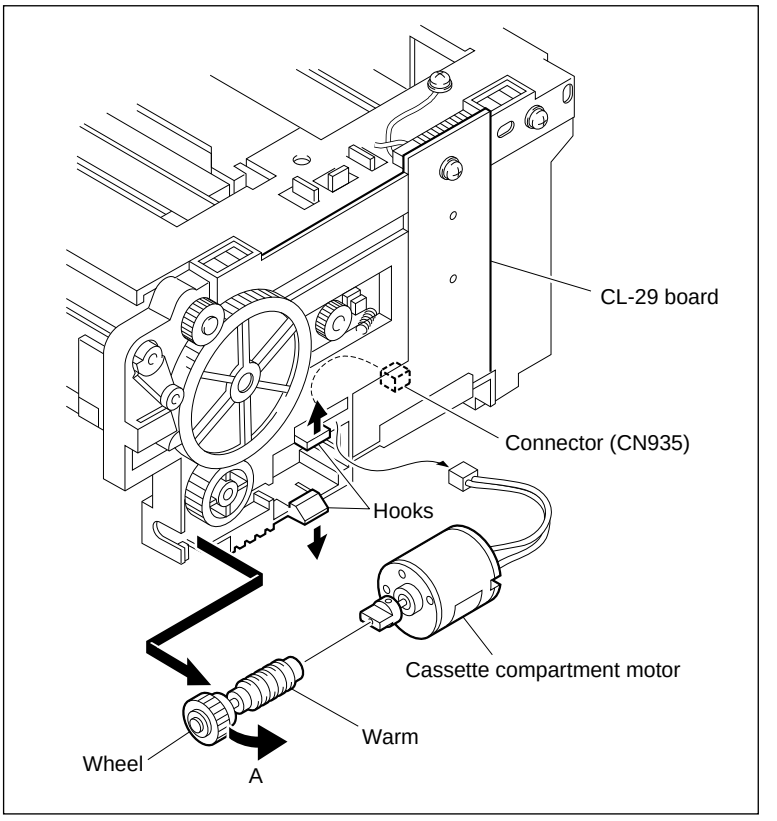
Disconnect the harness from the connector CN935 on the CL-29 board.

2. Remove the Warm

Push the wheel in the direction indicated by arrow A and take out the warm.

3. Remove the Cassette Compartment Motor

Spread the hooks of the chassis and push out the cassette compartment motor from the inside of the cassette compartment.



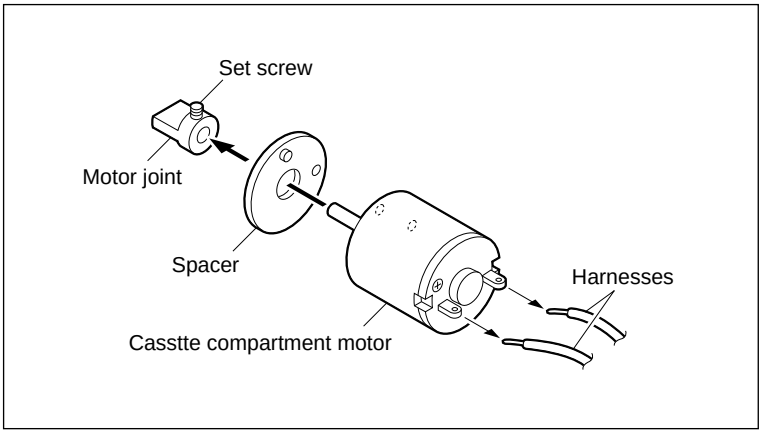
Remove the Cassette Compartment Motor (1)

4. Remove the Motor Joint

Loosen the set screw by two to three turns and remove the motor joint.

5. Remove the Spacer and Disconnect the Harness

(1) Remove the spacer.
(2) Unsolder and disconnect the harness from the motor.



Remove the Cassette Compartment Motor (2)

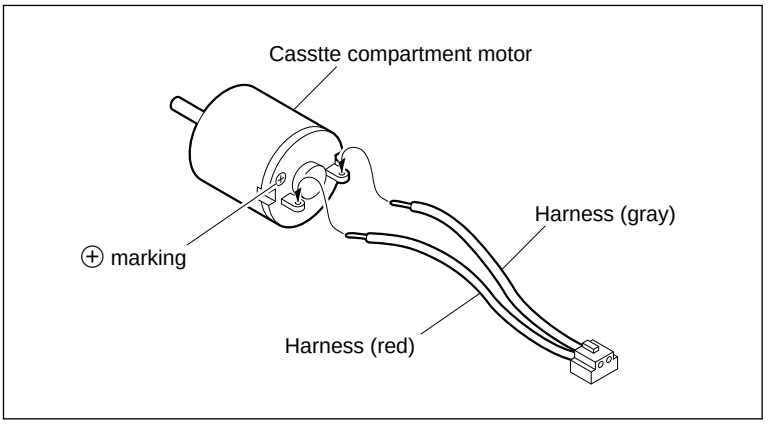
Installation

6. Harness Soldering

Solder the harness disconnected in (2) of procedure 5 to a new motor.

Note

Solder a red harness to marking "+" of the motor.



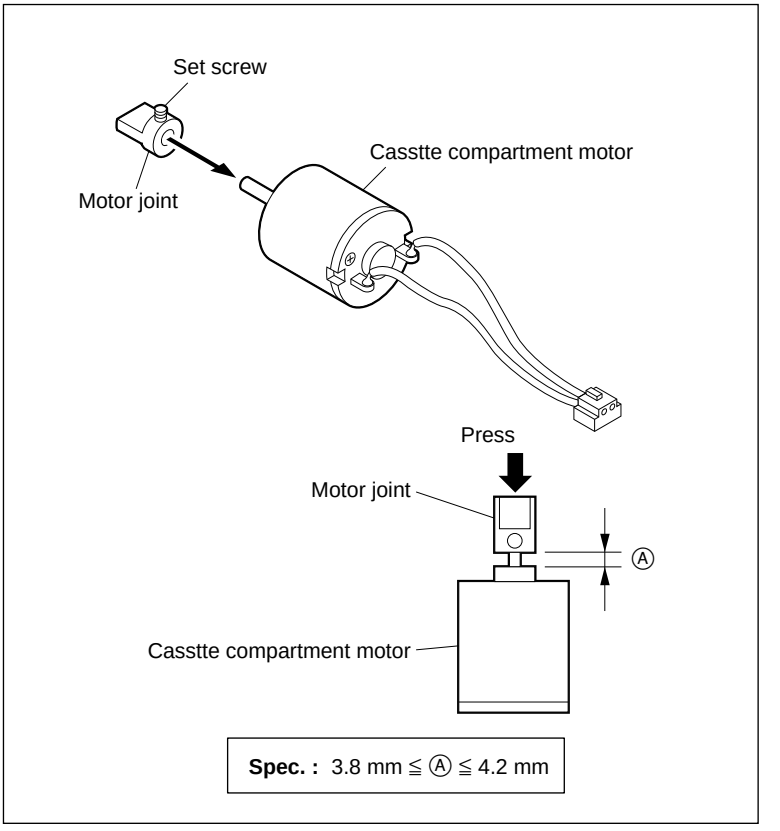
Harness Soldering

7. Install the Motor Joint

(1) Pass the motor joint through the shaft of the motor and fix the set screw temporarily.

(2) Confirm that the clearance between the motor joint and motor satisfies the specification when the motor joint is pushed toward the motor and tighten the setscrew.

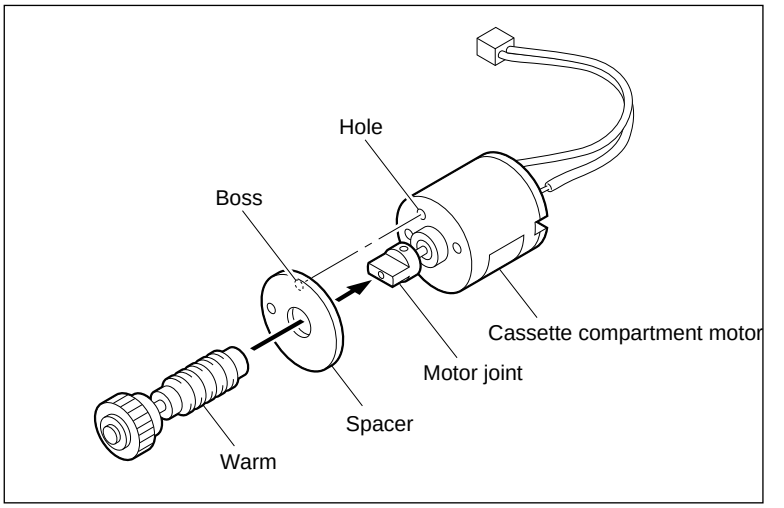
Tightening torque: 60×10^{-2} N • m
(6 kgf • cm)



Install the Motor Joint

8. Install the Spacer and Warm

(1) Put the boss of the spacer in the hole of the motor.
(2) Align the warm with the motor joint, then insert it.



Install the Spacer and Warm

9. Install the Cassette Compartment Motor

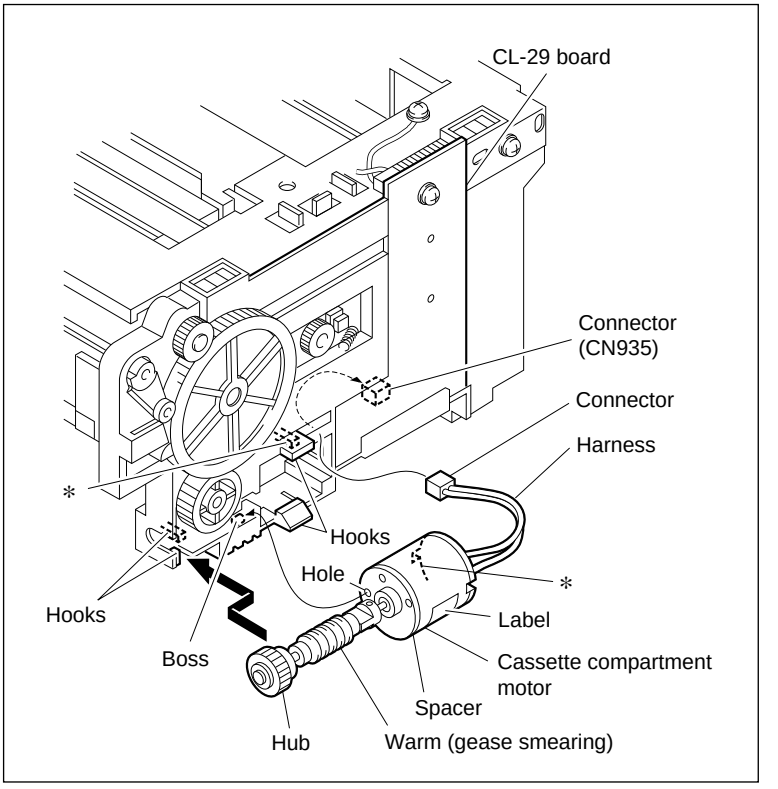
(1) Put the motor in the direction shown in the figure and pass the harness through the hole of the chassis.
(2) Place the ∗-marked portion of the motor shown in the figure and put the motor in the two hooks while inserting the hole of the spacer into the boss of the chassis. Simultaneously, put the hub of the warm in the two hooks of the chassis.
(3) Confirm that the motor has been fixed.

10. Grease Smearing

(1) Wipe the grease on the warm and clean it.
(2) Smear grease slightly to the warm.

11. Connect the Harness

Connect the connector of the cassette comportment motor's harness to connector CN935 on the CL-29 board.



Install the Cassette Compartment Motor

Adjustment after Replacement

12. Check the Cassette Compartment Motor Operation

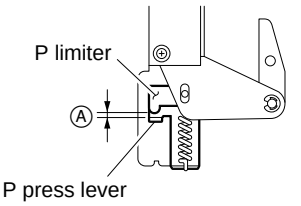
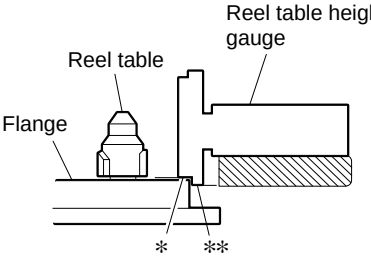
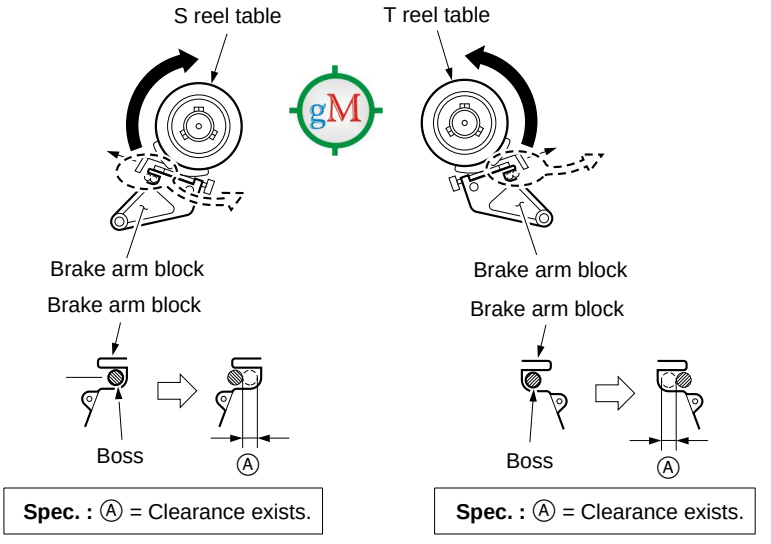
Refer to Section 4-2 of the maintenance manual part 1.
(C013: CASSETTE COMP.)

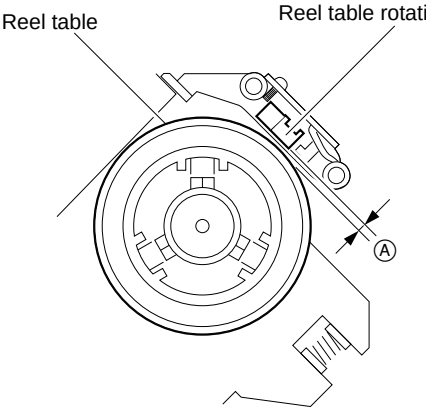
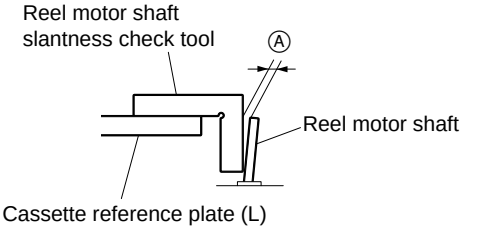
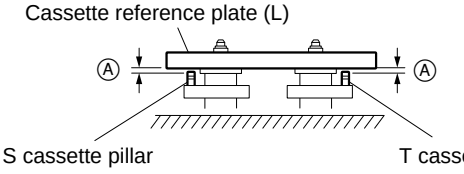
Note

Perform this check with the cassette compartment installed in the unit.

3-27. Mechanical Adjustment Table

Index

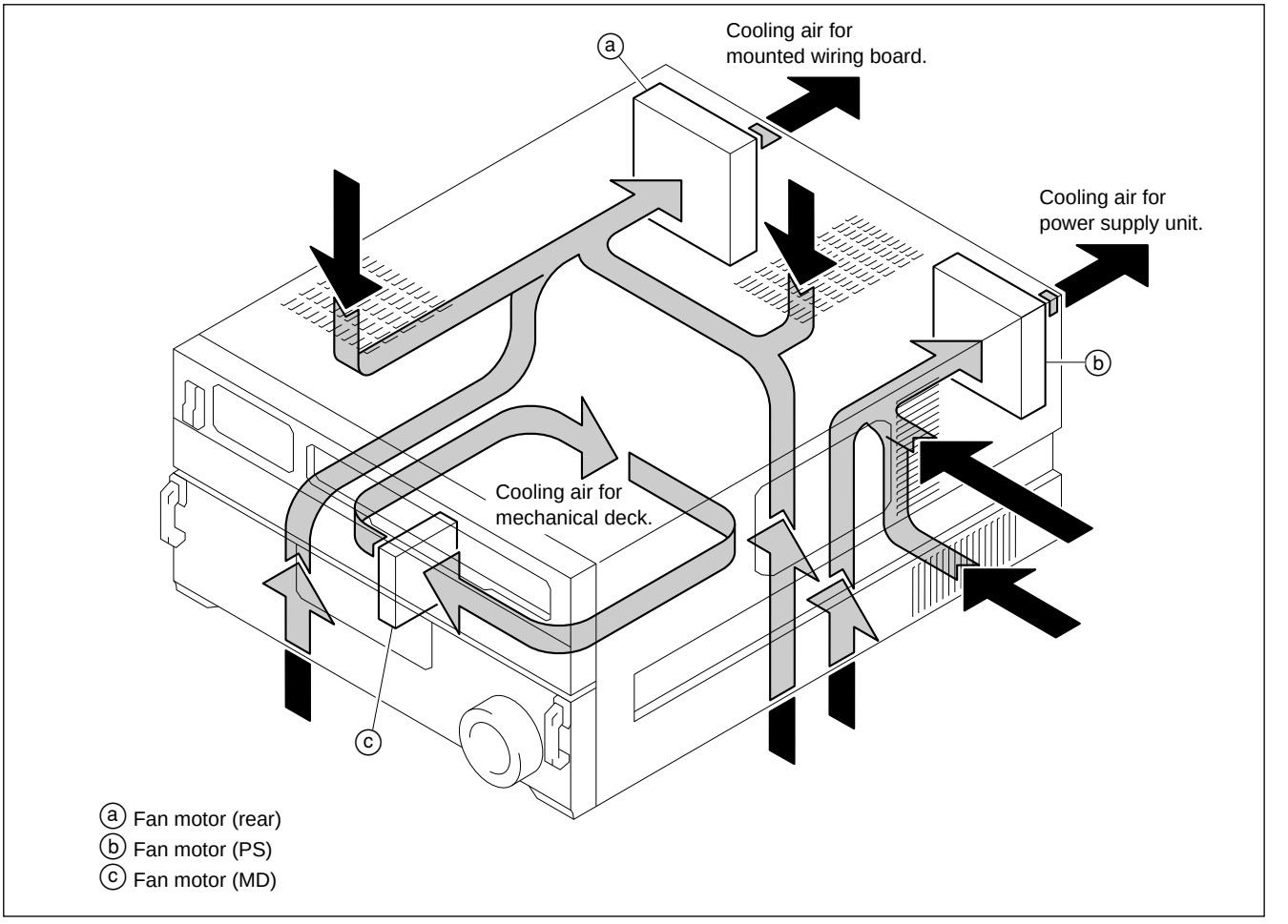
Adjustment	Specification	Page
Pinch Press Clearance Adjustment	 **Spec. :** Ⓐ = 0.6 to 0.8 mm	3-57
Reel Table Height Adjustment	 **Spec. :** The ∗ marked portion of the gauge slide over the frange of the reel table. The ∗∗ marked portion of the gauge does not slide over.	3-71
Reel Brake Clearance Check	 **Spec. :** Ⓐ = Clearance exists. **Spec. :** Ⓐ = Clearance exists.	3-74
Reel Brake Release Amount Adjustment	**Spec. :** The brake lining does not touch a reel table while reel table rotatong.	3-75

Adjustment	Specification	Page
Reel Rotation Sensor Position Adjustment	 **Spec. :** Ⓐ = 0.1 mm or more	3-77
Reel Motor Shaft Slantness Adjustment	 **Spec. 1 :** (L cassette position) Ⓐ ≦ 0.03 mm **Spec. 2 :** (S cassette position) Ⓐ ≦ 0.1 mm	3-92
Cassette Pillar Height Adjustment	 **Spec. :** Ⓐ = No clearance exists.	3-95

3-28. Fan Motor Replacement

This unit has three fan motors. Replace each fan motors every 40,000 hours of energizing.

1. Index



2. Note

- Replace the fan motors when displaying a alarm informing for fan motor in addition to the periodic replacement.
- When the fan motor stops because of trouble, some components inside the unit may be heated to high temperatures.
  Take care not to burn your hands by touching these components.
  In service operation, turn off the power and perform the service operation after the temperatures turns to ordinary state.

3-28-1. Fan Motor (Rear) Replacement

Outline

Replacement

1. Remove the Connector Panel
2. Remove the Fan Motor (Rear)
3. Install the Fan Motor (Rear)
4. Install the Connector Panel

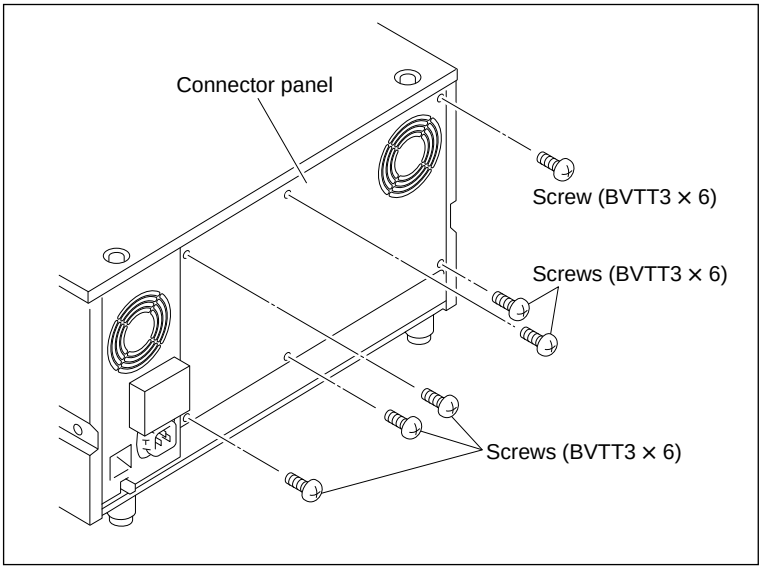
Removal

1. Remove the Connector Panel

Loosen the six screws and remove the connector panel.

Note

It is not neccessary to disconnect the harness connected to the connector panel.



Remove the Connector Panel

2. Remove the Fan Motor (Rear)

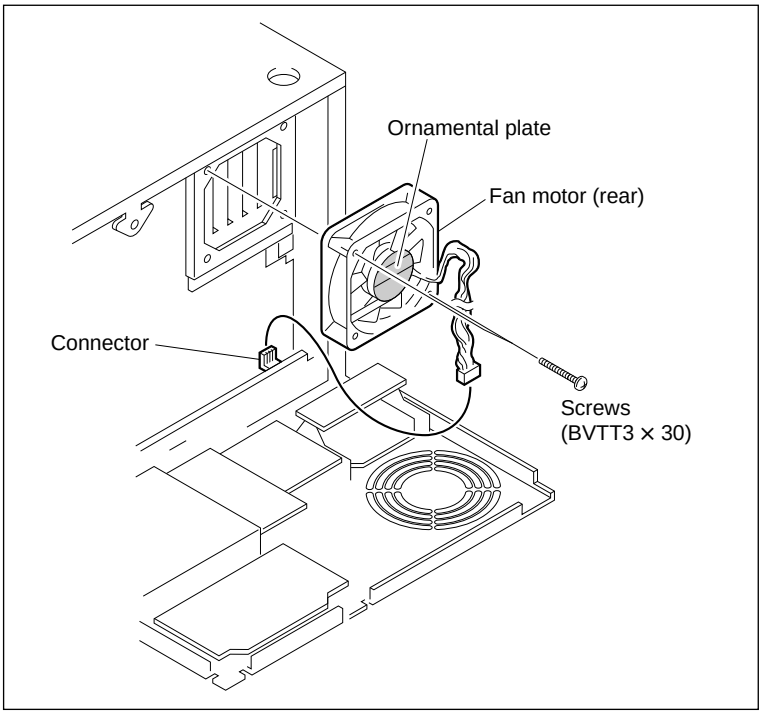
(1) Disconnect the harness of the fan motor (rear) from the connector shown in the figure.
(2) Loosen the two screws and remove the fan motor (rear).

3. Install the Fan Motor (Rear)

(1) Install a new fan motor (rear) so that the ornamental plate faces to outside and harness is bottom right side, and tighten the two screws.
(2) Connect the connector of the fan motor (rear).

4. Install the Connector Panel

Install the connector panel and tighten the six screws.



Remove/Install the Fan Motor (Rear)

3-28-2. Fan Motor (PS) Replacement

Outline

Replacement

1. Remove the Power Supply Panel Assembly
2. Remove the Fan Motor (PS)
3. Install the Fan Motor (PS)
4. Install the Power Supply Panel Assembly

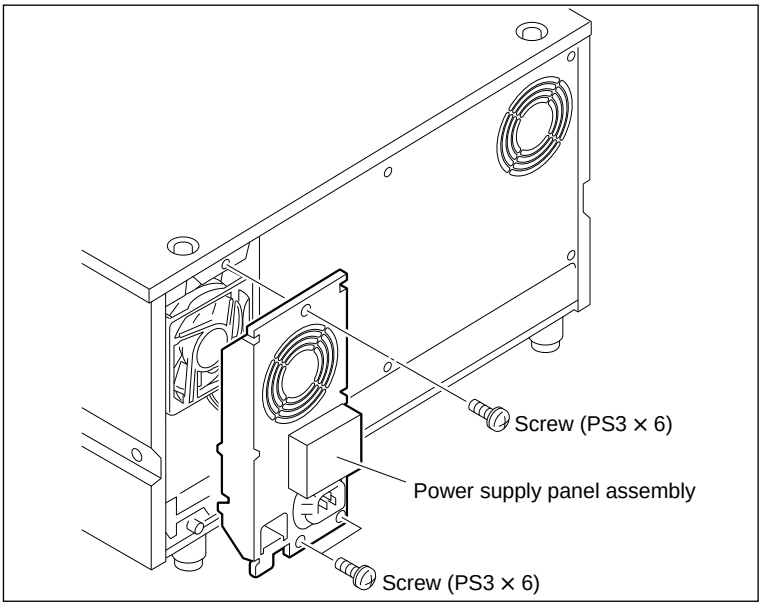
Removal

1. Remove the Power Supply Panel Assembly

Loosen the three screws and remove the power supply panel assembly.

Note

It is not neccessary to disconnect the harness connected to the power supply panel assembly.



Remove the Power Supply Panel Assembly

2. Remove the Fan Motor (PS)

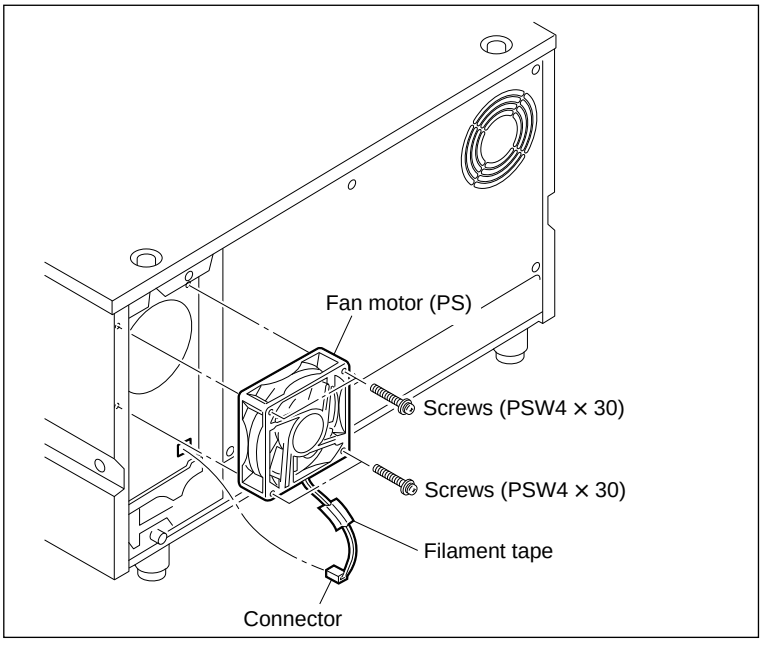
(1) Take off the filament tape fixing the harness of the fan motor (PS).
(2) Disconnect the harness of the fan motor (PS) from the connector shown in the figure.
(3) Loosen the four screws and remove the fan motor (PS).

3. Install the Fan Motor (PS)

(1) Install a new fan motor (PS) so that the ornamental plate faces to outside and harness is bottom left side, and tighten the four screws.
(2) Connect the connector of the fan motor (PS).
(3) Stick a filament tape to fix the harness of the fan motor (PS).

4. Install the Power Supply Panel Assembly

Install the power supply panel assembly and tighten the three screws.



Remove/Install the Fan Motor (PS)

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3-28-3. Fan Motor (MD) Replacement

Outline

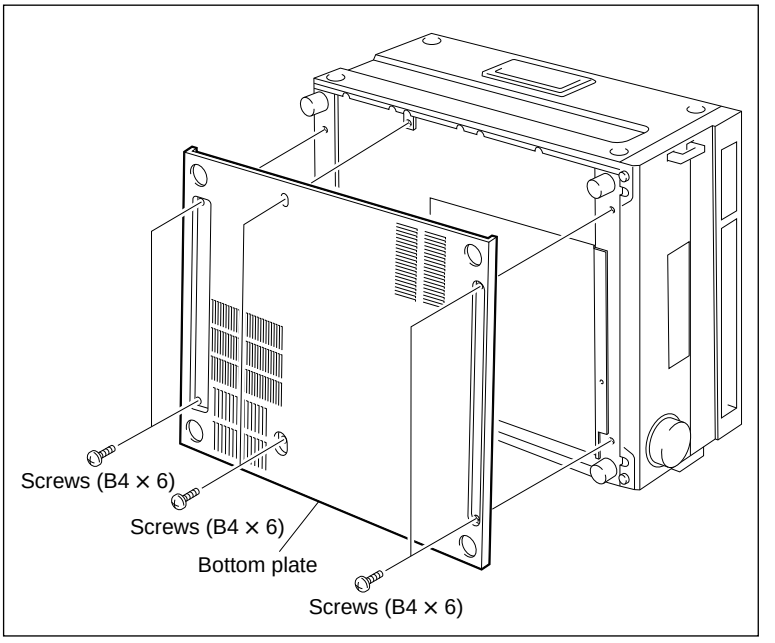
Replacement

1. Remove the Bottom Plate
2. Remove the Shield Plate (Bottom)
3. Replace the Fan Motor (MD)
4. Install the Fan Motor (MD)
5. Install the Shield Plate (Bottom)
6. Install the Bottom Plate

Removal

1. Remove the Bottom Plate

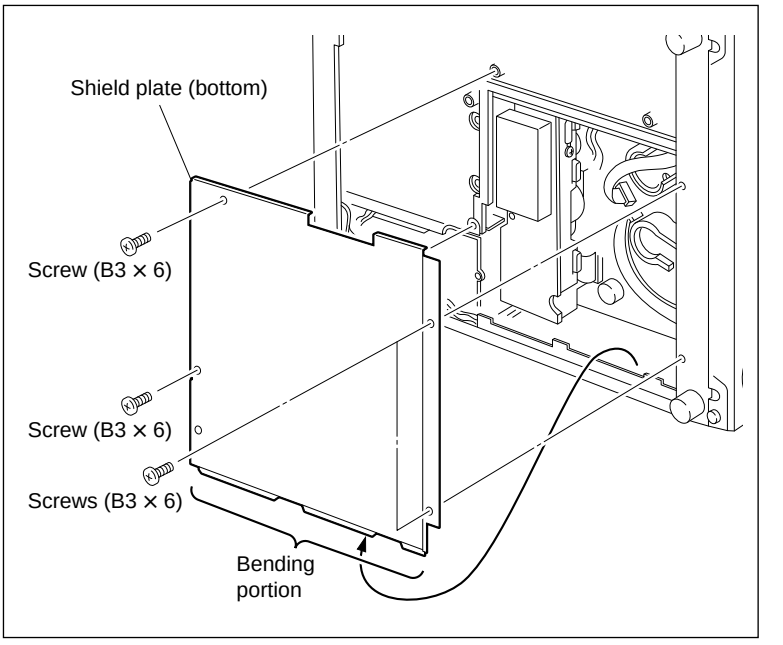
(1) Place the unit on its right side panel down.
(2) Loosen the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Remove the Shield Plate (Bottom)

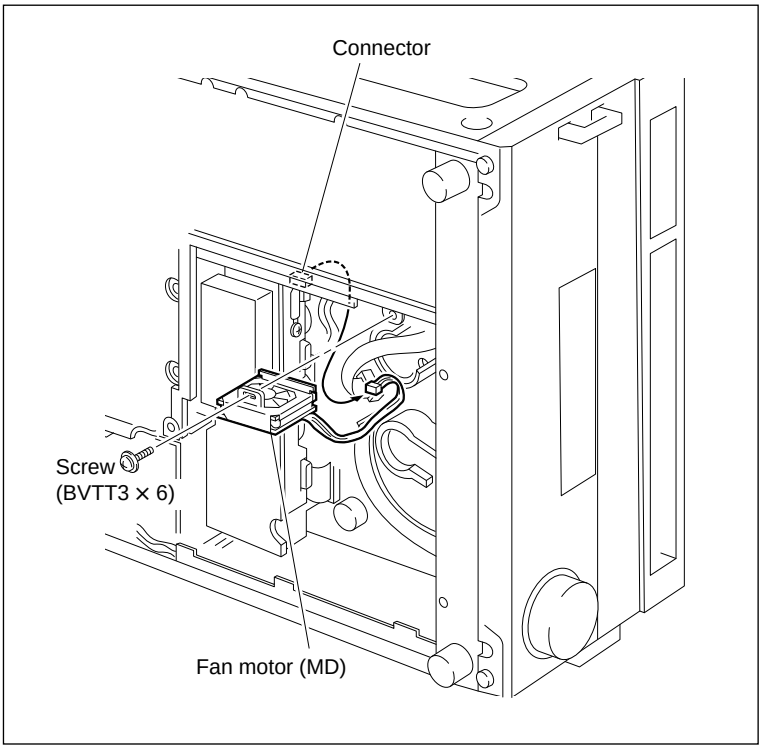
Remove the four screws, and then remove the shield plate (bottom).



Remove the Shield Plate (Bottom)

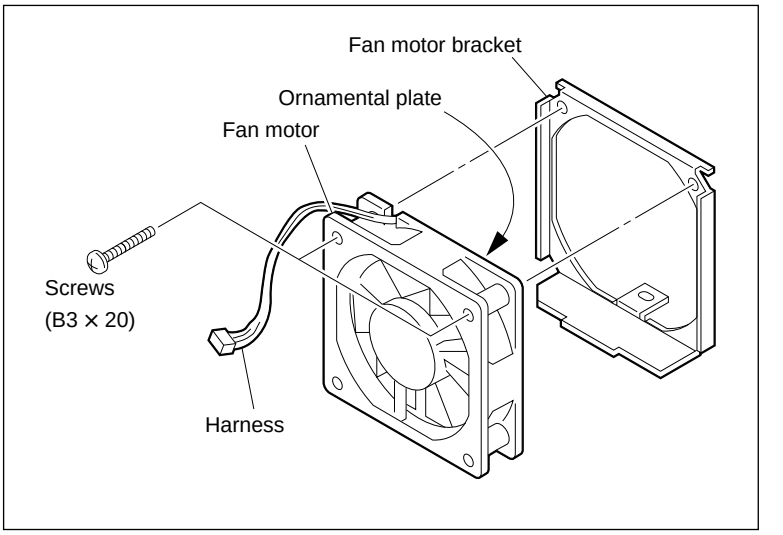
3. Replace the Fan Motor (MD)

(1) Disconnect the connector shouwn in the figure.
(2) Loosen a screw and remove the fan motor (MD).



Replace the Fan Motor (MD)

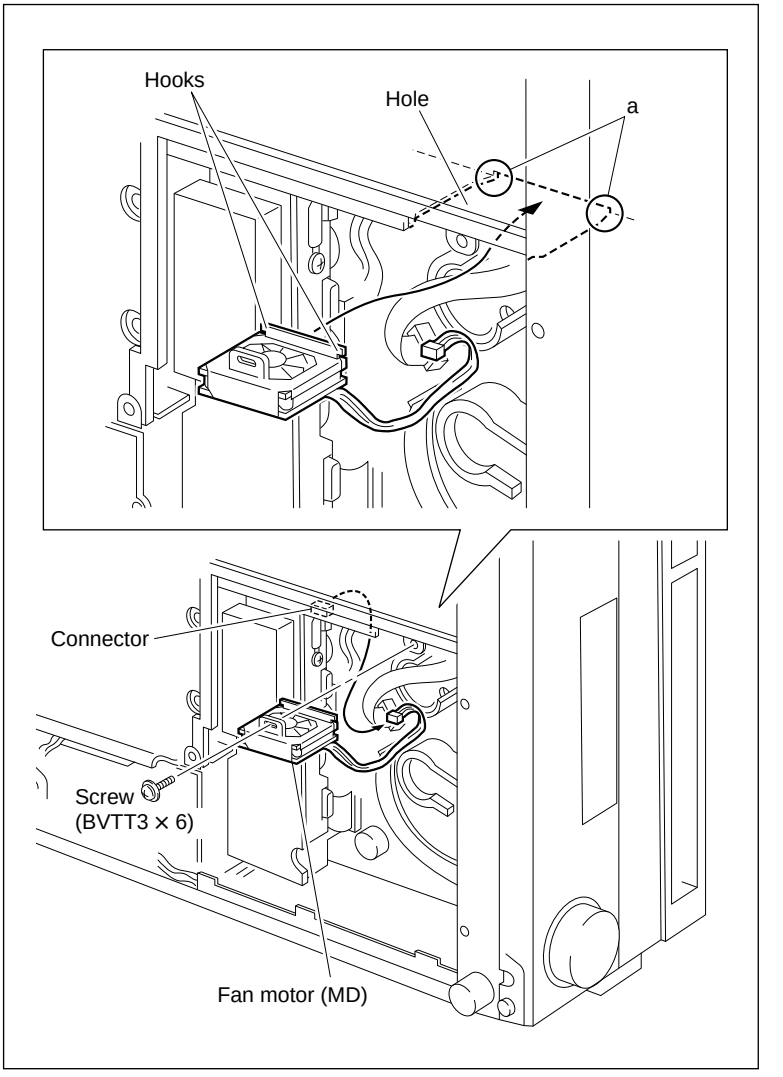
(3) Loosen the two screws and remove the fan motor (MD) from the fan motor bracket.
(4) Install the fan motor (MD) to the fan motor bracket so that the ornamental plate faces to side of the fan motor bracket and the harness is top left side, and tighten the two screws.



Replace the Fan Motor (MD)

4. Install the Fan Motor (MD)

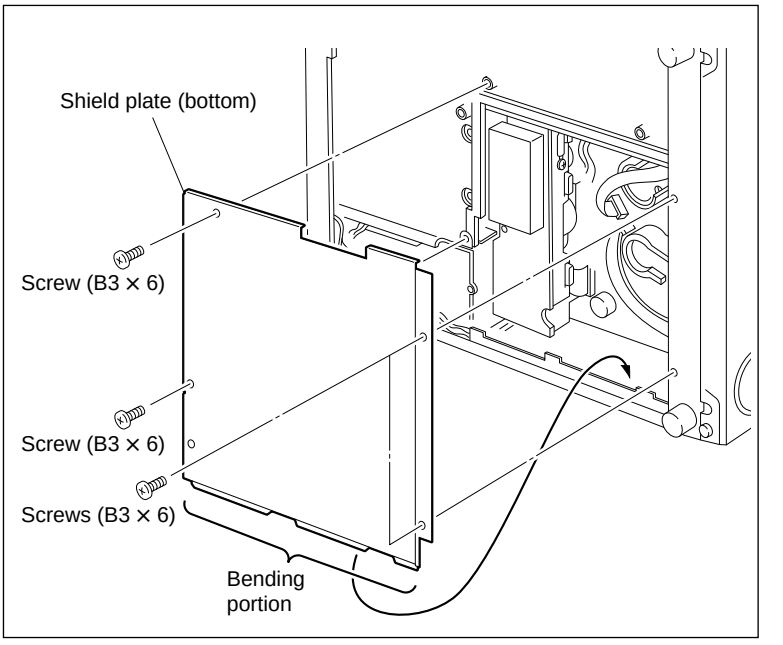
(1) Put the hook of the fan motor bracket to the portions “a” of the chassis.
(2) Install the fan motor (MD) and tighten the screw.
(3) Connect the harness of the fan motor (MD) to the connector (CN161).



Install the Fan Motor (MD)

5. Install the Shield Plate (Bottom)

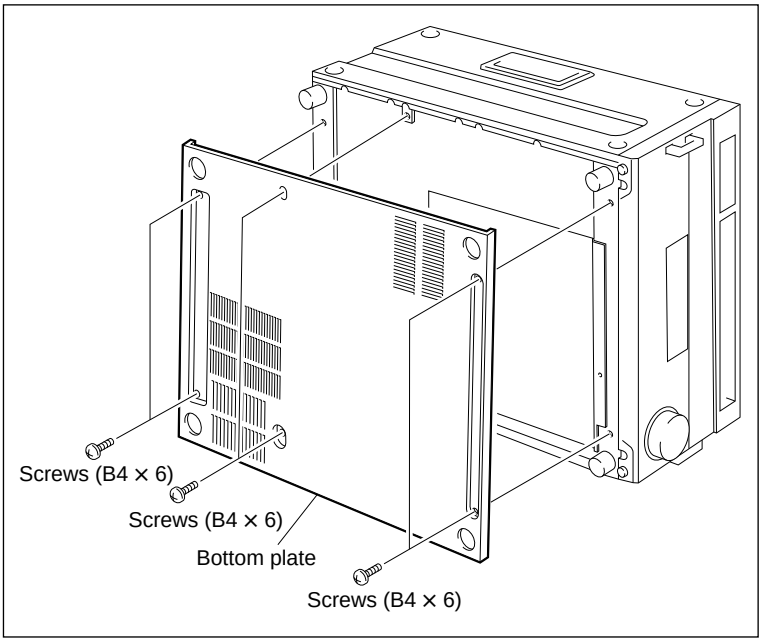
Tighten the shield plate (bottom) with four screws.



Install the Shield Plate (Bottom)

6. Install the Bottom Plate

Tighten the bottom plate with six screws.



Install the Bottom Plate

3-29. Power Supply Unit Replacement

Outline

Replacement

1. Remove the Bottom Plate
2. Disconnect the Harness
3. Remove the Power Supply Panel Assembly
4. Remove the Power Supply Unit
5. Install the Power Supply Unit
6. Install the Power Supply Panel Assembly
7. Connect the Harness
8. Install the Bottom Plate
9. Confirm the Operation

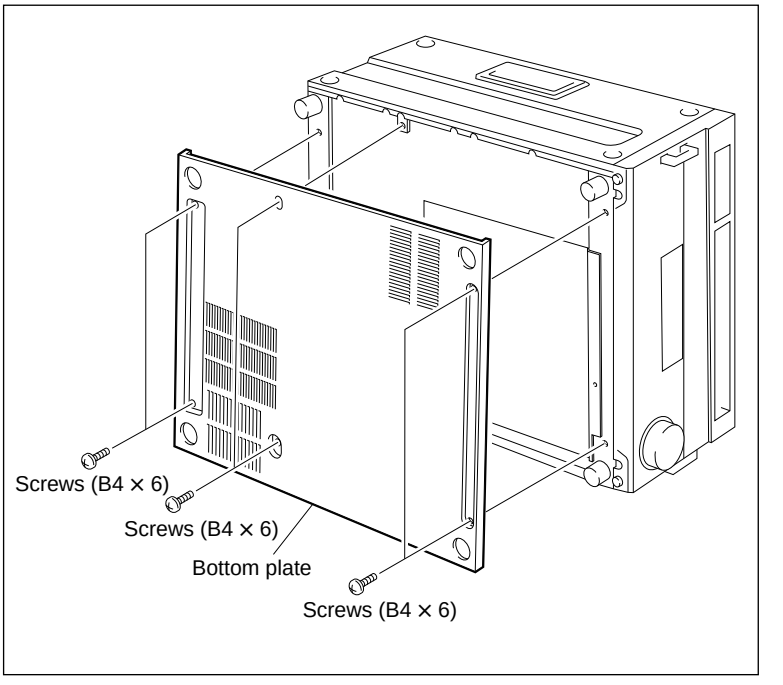
Preparation

1. Turn the power off and then wait over 30 seconds.
2. Remove the power supply cord plug from the outlet.

Removal

1. Remove the Bottom Plate

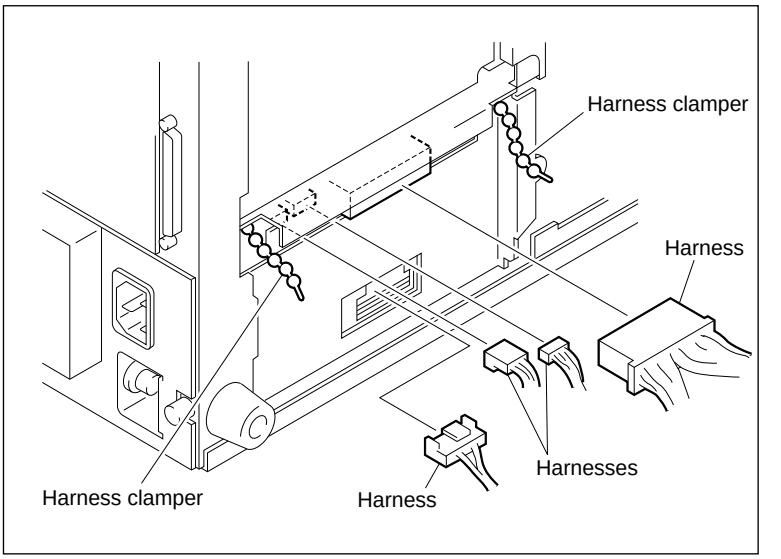
(1) Place the unit on its right side panel down.
(2) Remove the six screws and remove the bottom plate.



Remove the Bottom Plate

2. Disconnect the Harness

(1) Release the two harness clampers as shown in the figure.
(2) Disconnect the four harnesses.



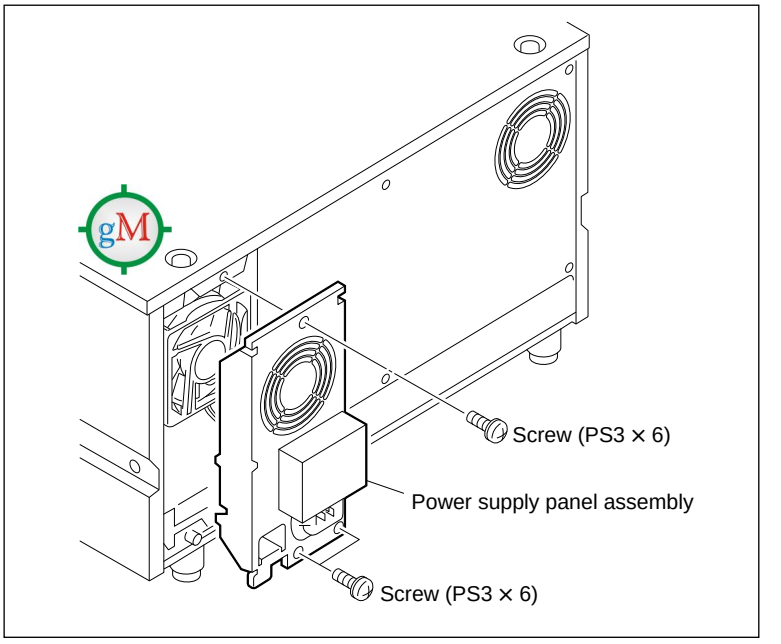
Disconnect the Harness

3. Remove the Power Supply Panel Assembly

Remove the three screws and open the power supply panel assembly.

Note

It is not necessary to disconnect the harness connected to the power supply panel assembly.



Remove the Power Supply Panel Assembly

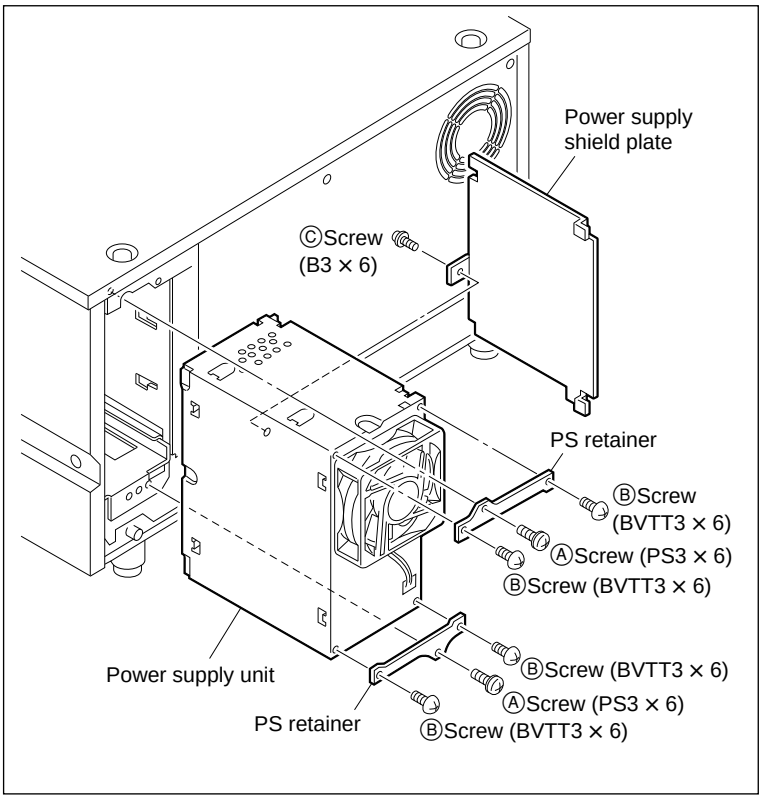
4. Remove the Power Supply Unit

(1) Remove the two screws (Ⓐ).
(2) Pull out the power supply block.

Installation

5. Install the Power Supply Unit

(1) Remove the four screws (Ⓑ) and remove the two PS retainers.
(2) Remove a screw (Ⓒ), then remove the power supply shield plate.
(3) Install the two PS retainers to new power supply unit and tighten the four screws (Ⓑ).
(4) Install the power supply shield plate to new power supply unit and tighten a screw (Ⓒ).
(5) Install the power supply unit and tighten the two screws (Ⓐ).



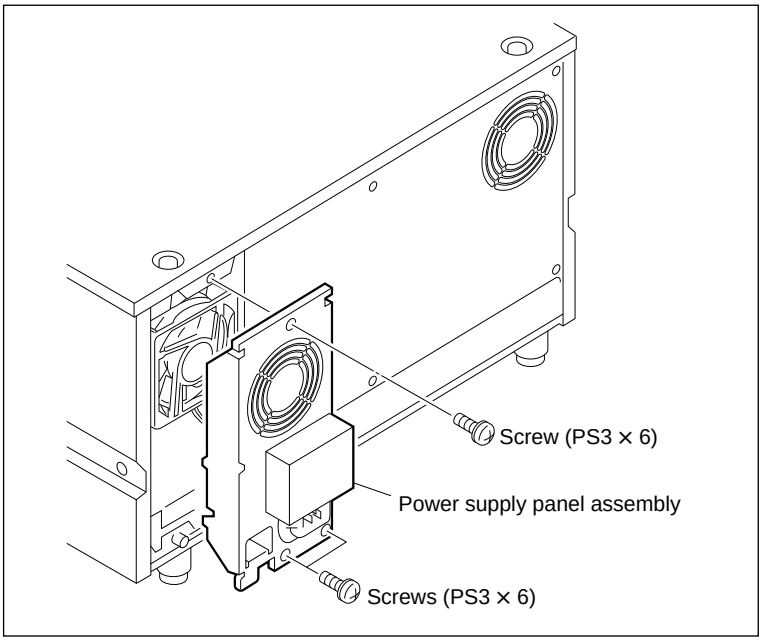
Remove/Install the Power Supply Unit

6. Install the Power Supply Panel Assembly

Install the power supply panel assembly and tighten the three screws.

Note

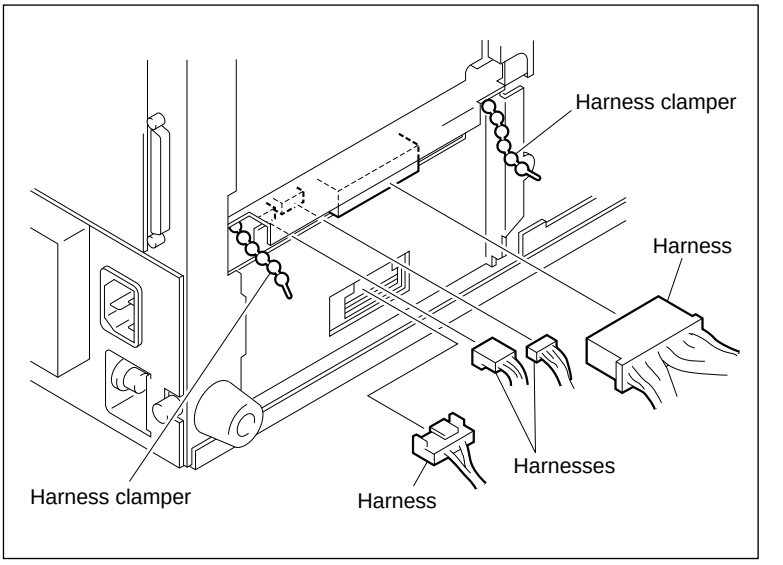
Be careful not to catch the harness.



Install the Power Supply Panel Assembly

7. Connect the Harness

(1) Connect the each harness to four connectors shown in the figure.
(2) Hold the harnesses using a harness clamper.



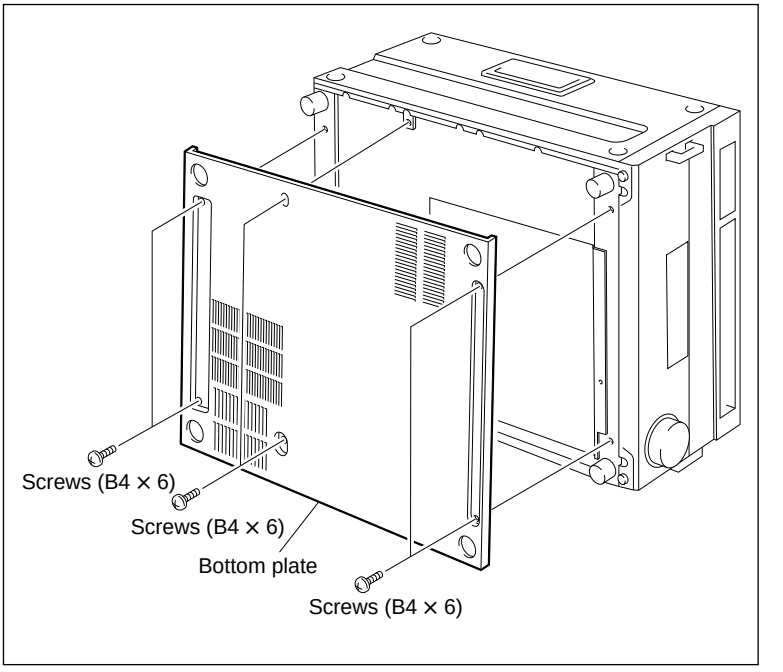
Connect the Harness

8. Install the Bottom Plate

(1) Install the bottom plate and tighten the six screws.
(2) Put the unit back.

9. Confirm the Operation

Turn the power on and confirm the unit runs in normal condition.



Install the Bottom Plate

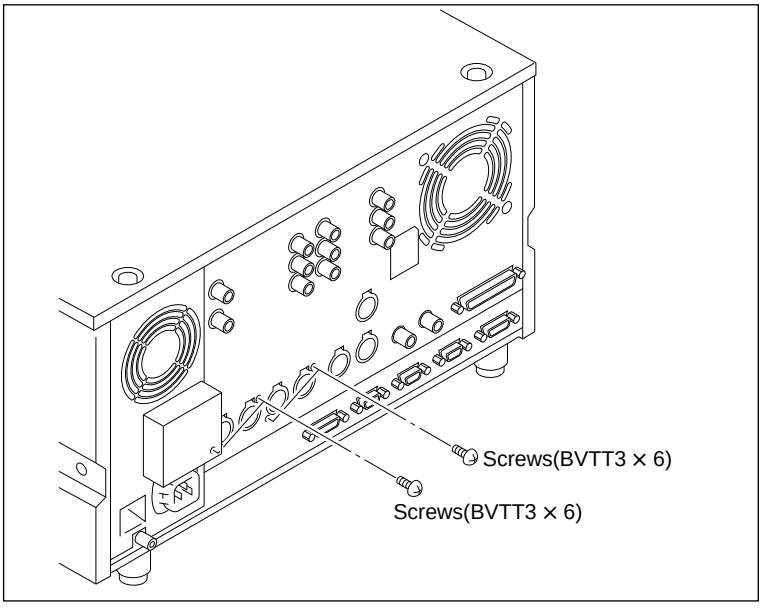
3-30. Mounted Circuit Board Replacement

This section explains the replacement procedures of circuit boards except plug-in boards.
Refer to Section 6 of the maintenance manual part 1 for piug-in board replacement.

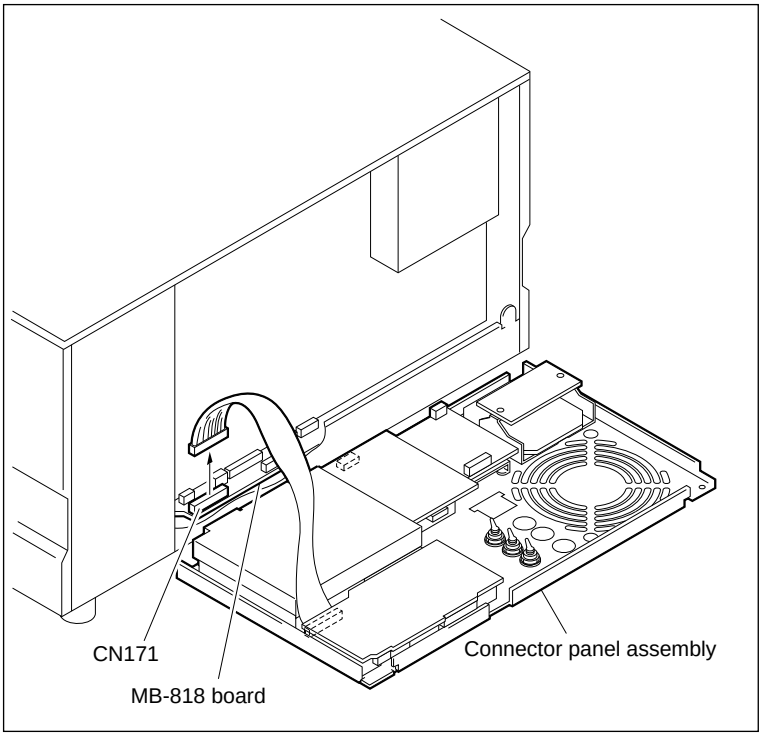
3-30-1. CP-278 Board

Replacement

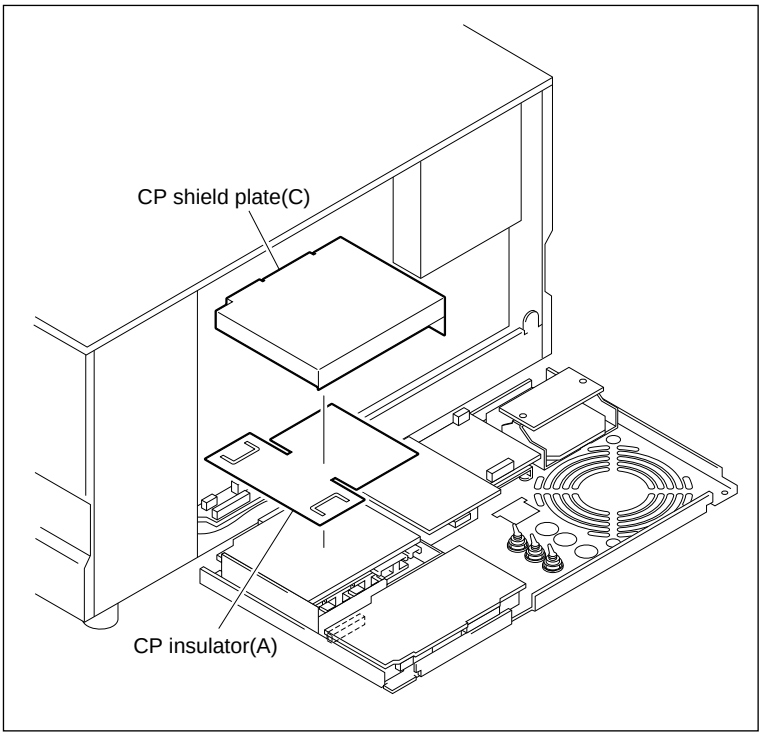
1. Turn the power off.
2. Remove the four screws (BVTT 3 × 6).



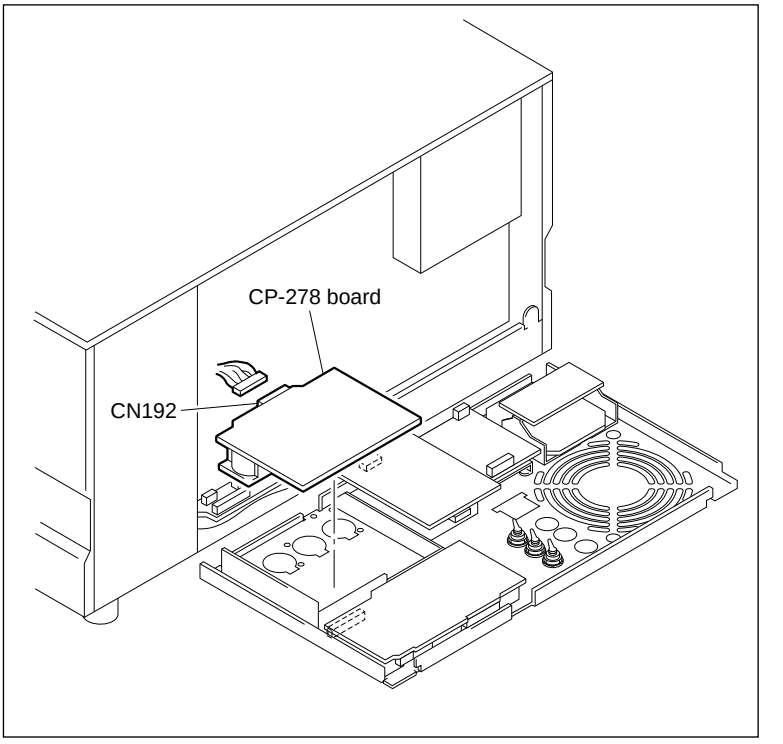
3. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
4. Disconnect the harness from the connector (CN171) on the MB-818 board.



5. Remove the CP shield plate (C) and CP insulator (A).



6. Disconnect the harness from the connector (CN192) on the CP-278 board, then remove the CP-278 board.



7. Install the CP-278 board in the reverse order of steps 2 through 6.

Confirmation after replacement

Confirm the output level of each analog audio channel.
(Refer to Section 1-9-6.)

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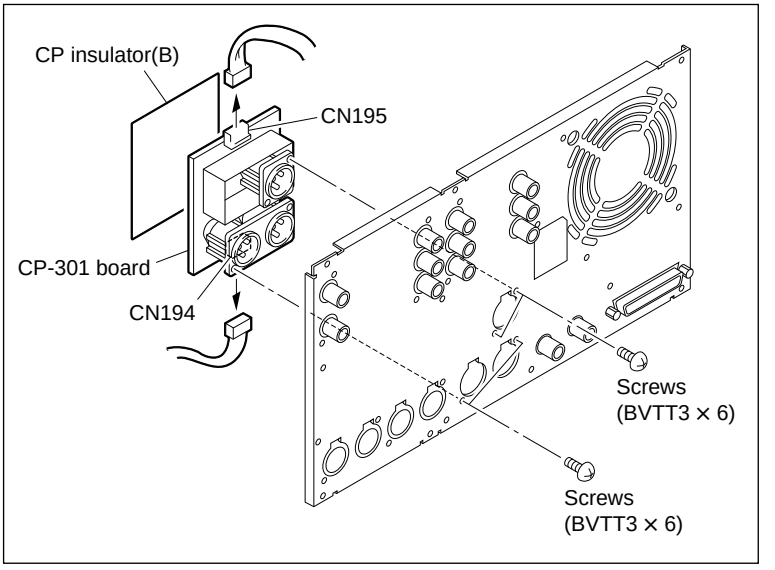
3-30-2. CP-301 Board

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Remove the four screws as shown in the figure.
4. Disconnect the hernesses from the connectors (CN194 and CN195) on the CP-301 board, then remove the CP-301 board.
5. Peel off the CP insulator (B).



6. Install the CP-301 board in the reverse order or steps 2 through 5.

Note

Adjustment after replacement is not required.

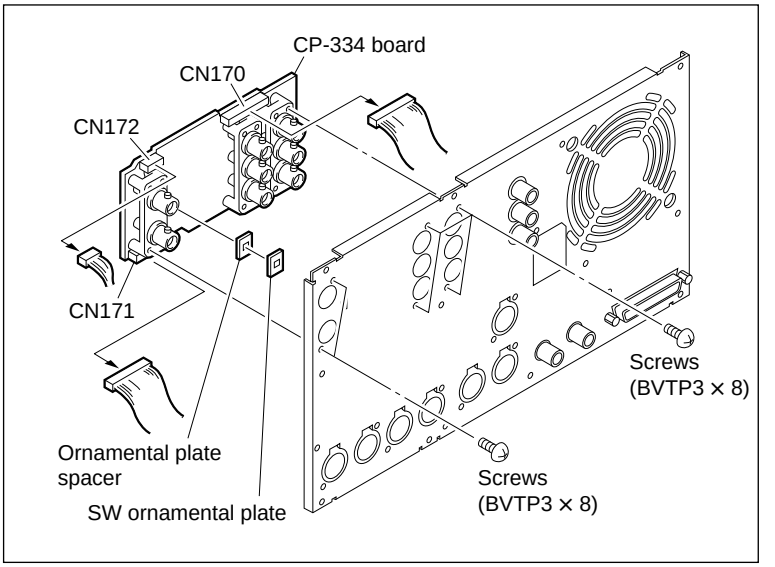
3-30-3. CP-334 Board

Replacement

1. Turn the power off.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Remove the six screws shown in the figure.
4. Disconnect the harnesses from the connectors (CN170,CN171 and CN172) on the CP-334 board, then remove the CP-334 board.

   Note

   One SW ornamental plate and one ornamental plate spacer can be removed in this case. Be careful not to lose them.
5. Install the CP-334 board in the reverse order of steps 2 through 4.



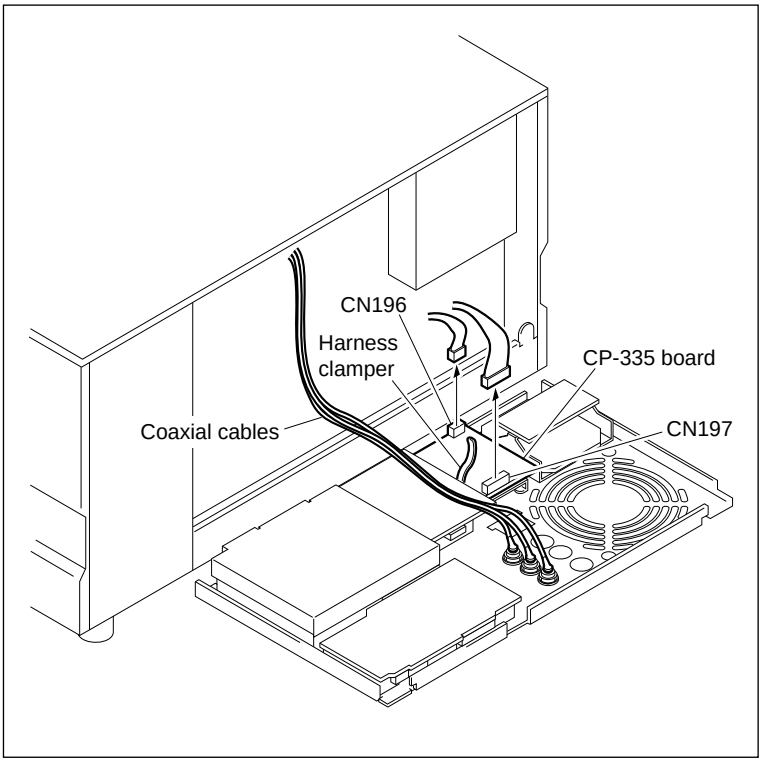
Confirmation after replacement

6. Confirm that the composite/component video output signals are normal. (Refer to Section 1-9-8.)

3-30-4. CP-335 Board

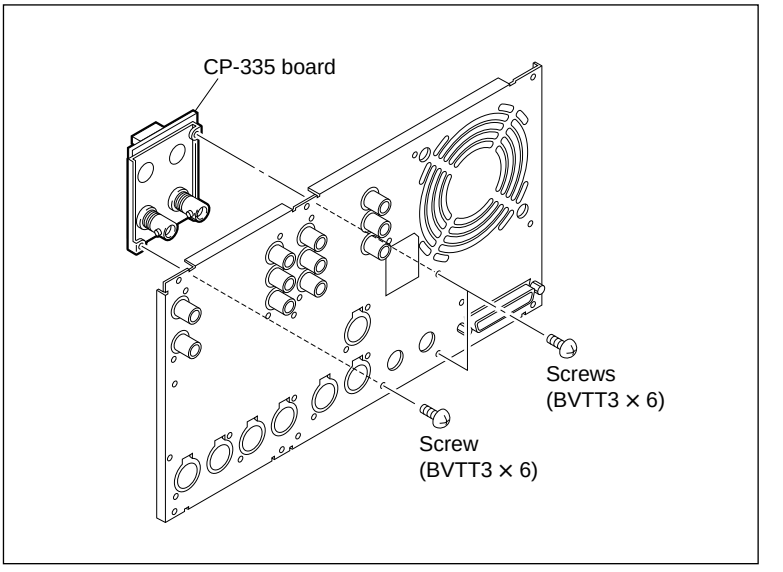
Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Open the harness clamper and release the coaxial cables.
4. Disconnect the harnesses from the connectors (CN196 and CN197) on the CP-335 board.



5. Remove the three screws as shown in the figure, then remove the CP-335 board.

6. Install the CP-335 board in the reverse order of steps 2 to 5.



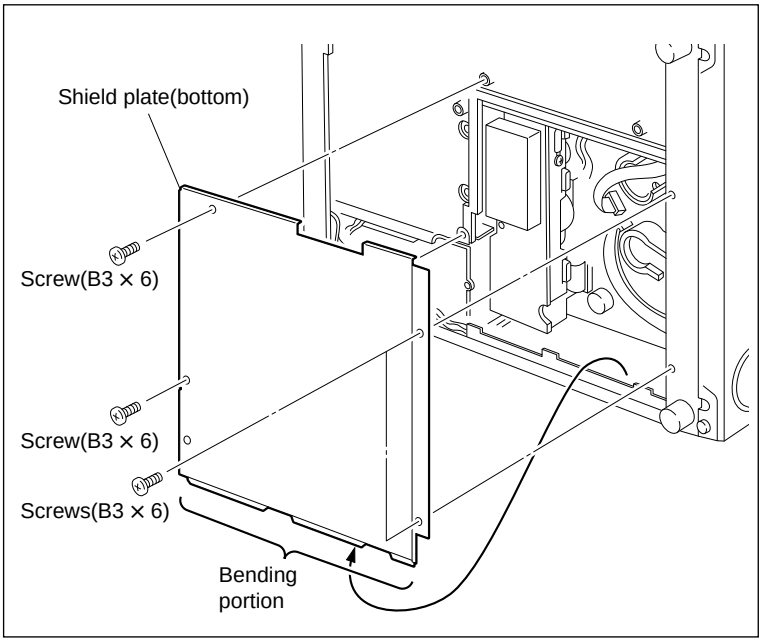
Confirmation after replacement

7. Confirm the output level of each AES/EBU channel.
(Refer to Section 1-9-9.)

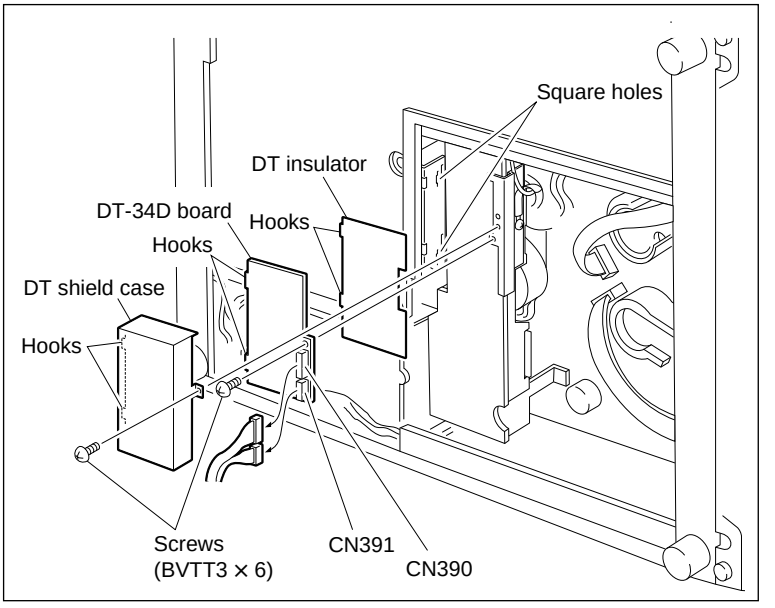
3-30-5. DT-34D Board

Replacement

1. Turn off the power.
2. Put the unit with the right side panel down and remove the bottom plate. (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the four screws, and then remove the shield plate (bottom).



4. Remove the screw, remove the two hooks from the square holes of the chassis, and then remove the DT shield case.
5. Disconnect the harnesses from connectors CN390 and CN391 on the DT-34D board.
6. Remove the screw, remove the two hooks from the square holes of the chassis, and then remove the DT-34D board and DT insulator.
7. Install the DT-34D board in the reverse order of steps 2 to 6.



Adjustment after replacement

8. Perform the DT system electrical adjustment. (Refer to Sections 2-5-6 and 2-5-9.)

3-30-6. DR-315 Board

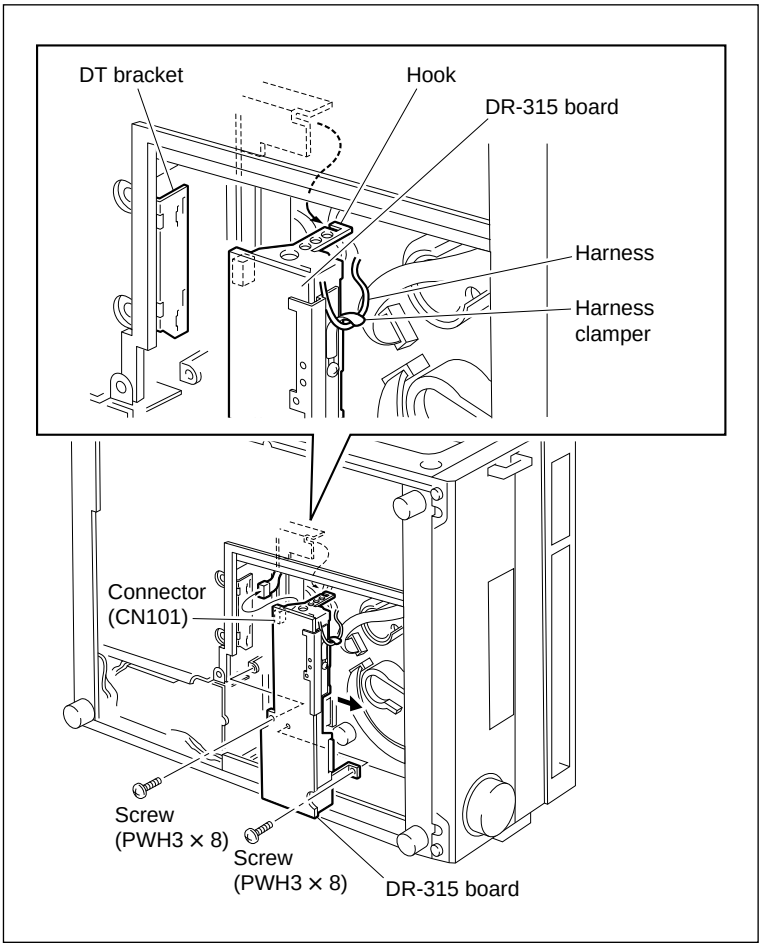
Replacement

1. Turn off the power.
2. Put the unit with the right side panel down and remove the bottom plate.
   (Refer to Section 2-3-1 of the maintenance manual part 1.)
3. Remove the shield plate (bottom).
   (Refer to Section 3-30-5.)
4. Remove the DT-34D board.
   (Refer to Section 3-30-5.)
5. Stretch the harness clamper on the DR-315 board and release the harnesses.
6. Remove the two screws shown in the figure.
7. Move the DR-315 board toward the reel motors, and detach the hook.

   Note

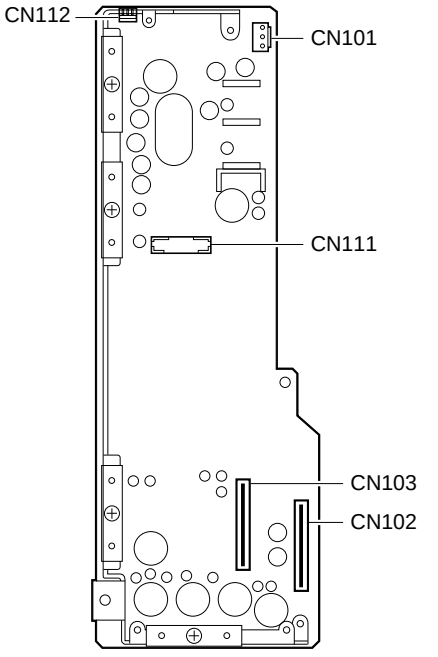
   The hook is hard to be seen since it is the inner part.

8. Pull out the DR-315 board as far as possible as shown in the figure.



9. Disconnect the hernesses and the flexible board from the connectors (CN101, CN102, CN103, CN111 and CN112) on the DR-315 board, then remove the DR-315 board.

<DR-315 board, side A>



10. Install the DR-315 board in the reverse order of steps 2 through 9.

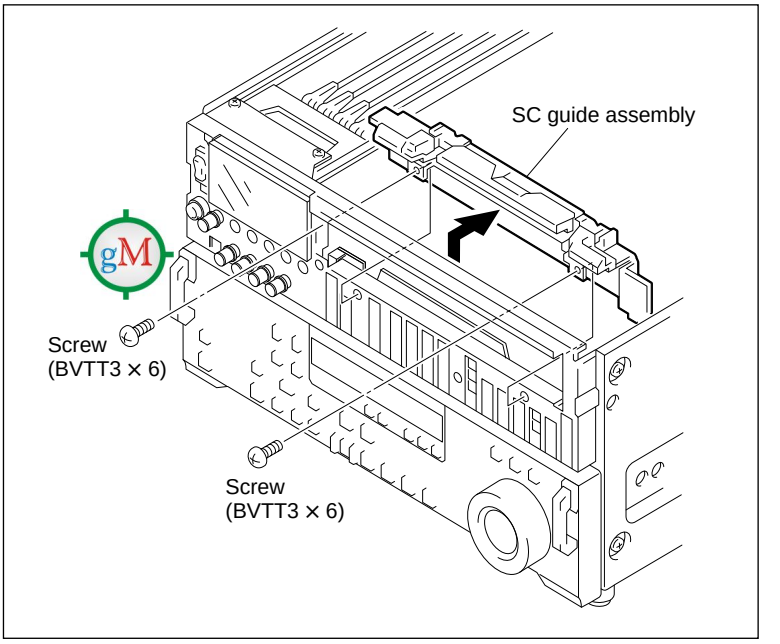
Adjustment after replacement

11. Perform the servo system electrical adjustment.
(Refer to Sections 2-5-3 and 2-5-5.)

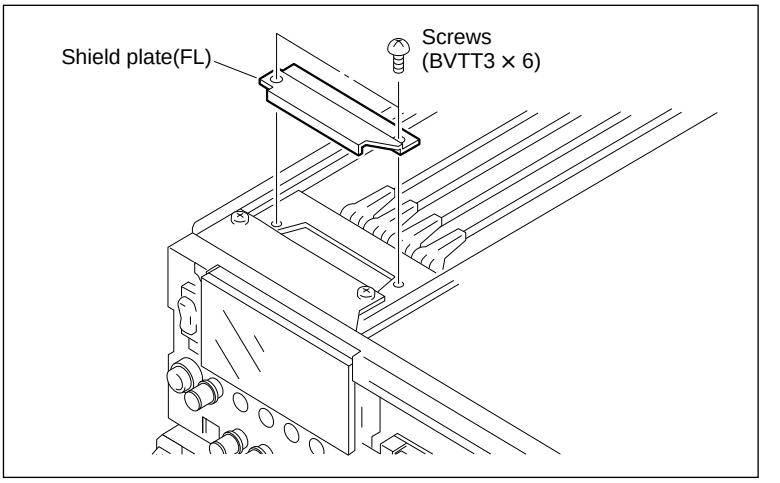
3-30-7. FP-117 Board

Replacement

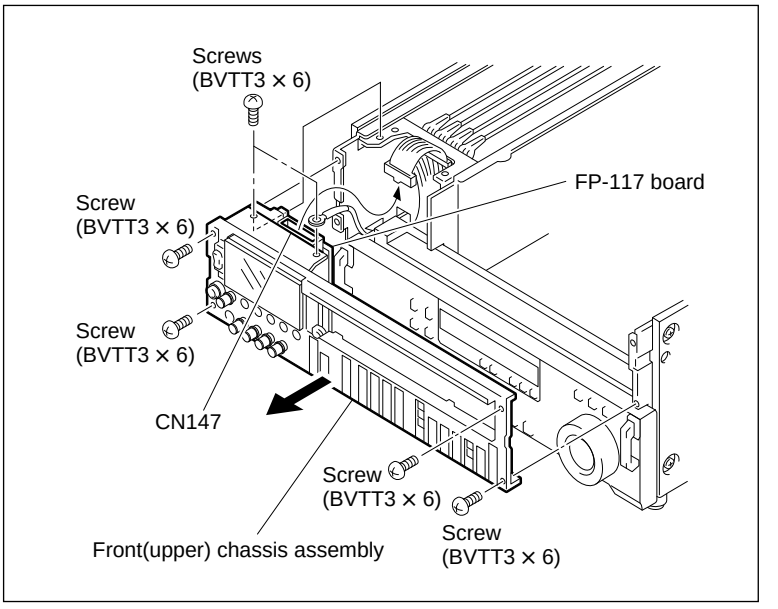
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the two screws, then remove the SC guide assembly.



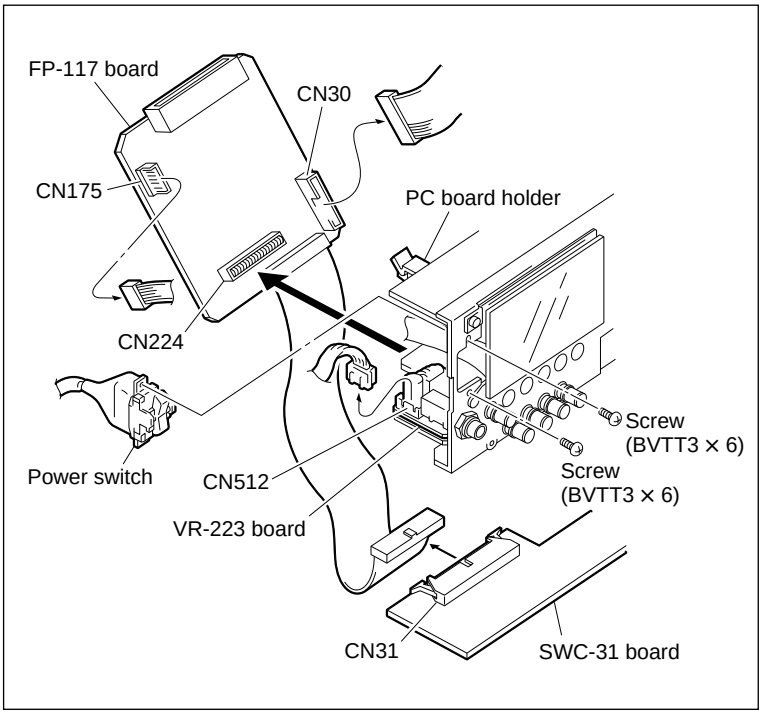
7. Remove the two screws, and then remove the shield plate (FL).



8. Disconnect the flat cable from the connector (CN147) on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



10. Remove the two screws, then remove the power switch.
11. Undo the PC board holder, then open the FP-117 board.
12. Disconnect the flat cable from the connector (CN30) on the FP-117 board.
13. Disconnect the harness and the flat cables from the connector (CN512) on the VR-223 board, connector (CN175, CN31) on the FP-117 board, and remove the front (upper) chassis assembly.
14. Disconnect the harness from the connector (CN224) on the FP-117 board, then remove the FP-117 board.
15. Install the FP-117 board in the reverse order of steps 2 through 14.



Notes

When connecting the connector (CN224), put the protrusions of the connector on the VR-224 board in the hollow of CN224, then put the FP-117 board vertically.

Adjustment after replacement

16. Perform the remote control offset adjustment. (Refer to Section 2-12.)

3-30-8. KY-438 Board

Replacement

1. Turn off the power.
2. Remove the lower control panel assembly. (Refer to Section 2-6 of the maintenance manual part1.)
3. Remove the six screws shown in the figure, then remove the KY protector and KY-438 board.

   Note

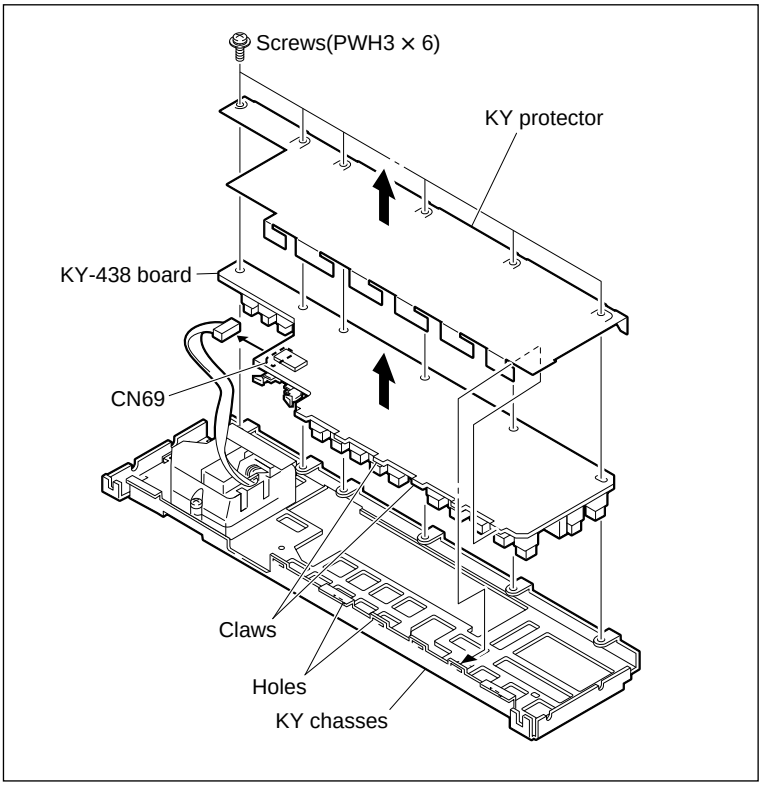
   While pulling out the claws of the KY-438 board from the holes of the KY chassis, remove the KY protector and KY-438 board simultaneously.

4. Disconnect the harness from the connector (CN69).

5. Install the KY-438 board in the reverse order of steps 2 through 4.

Note

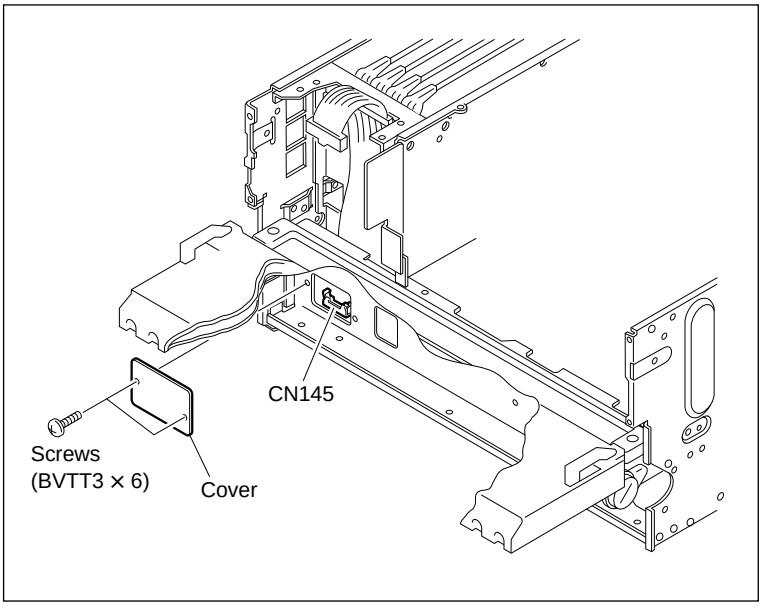
Adjustment after replacement is not required.



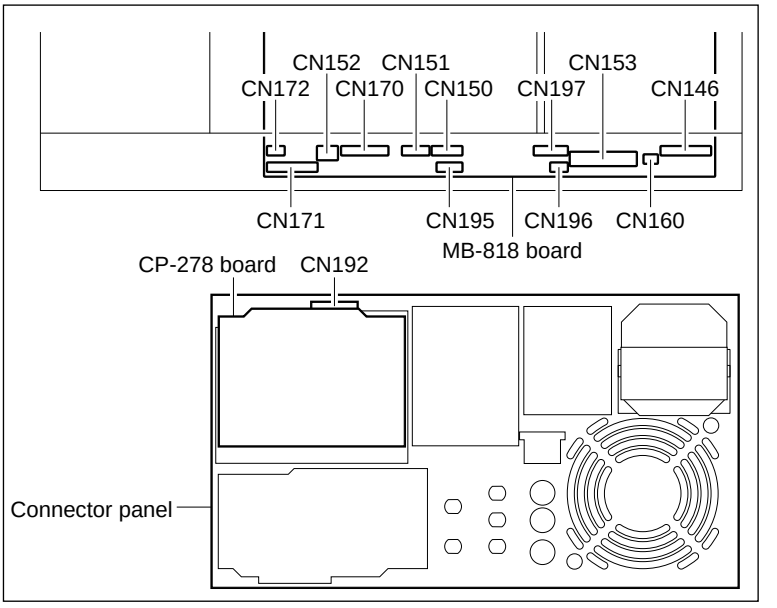
3-30-9. MB-818 Board

Replacement

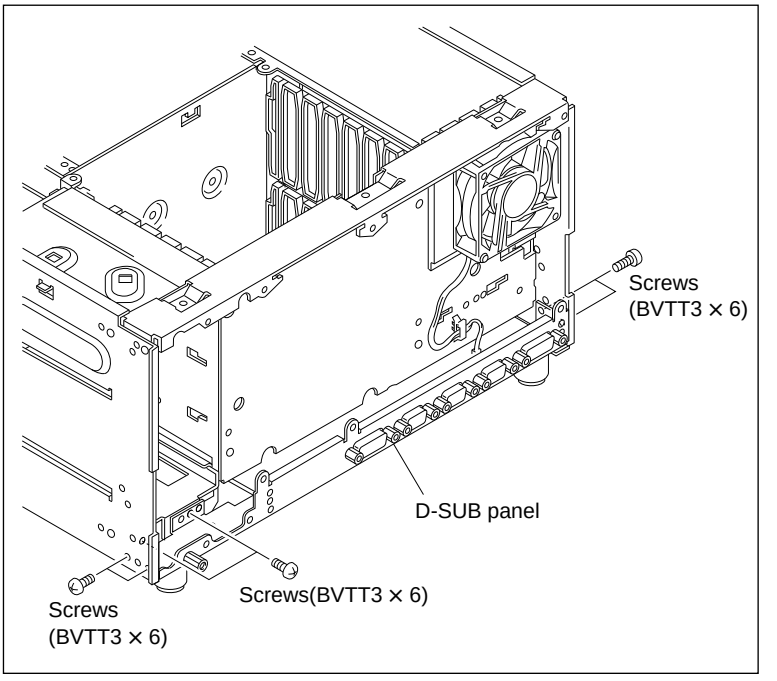
1. Turn off the power.
2. Remove the upper lid.
   (Refer to the Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Pull out the all plug-in boards.
   (Refer to Section 2-13 of the maintenance manual part1.)
8. Remove the right side panel.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
9. Remove the left side panel.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
10. Remove the two screws, and then remove the cover.
11. Disconnect the flat cable from connector CN145 on the MB-818 board.
12. Remove the power supply panel assembly.
    (Refer to Section 2-3-4 of the maintenance manual part1.)



13. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
14. Disconnect the harnesses from the connectors below on the MB-818 board.
    - Power supply unit harnesses
      CN150, CN151, CN152, and CN153
    - Connector panel harnesses
      CN146, CN170, CN171, CN172, CN195, CN196, and CN197
    - Fan motor (rear) harness
      CN160
15. Disconnect the harness from the connector CN192 on the CP-278 board. (Refer to Section 3-30-1.)



16. Remove the six screws fixing the D-Sub panel.



17. Put the unit with the right side plate down and remove the bottom plate. (Refer to Section 2-3-1 of the maintenance manual part1.)
18. Remove the four screws, and then remove the shield plate (bottom). (Refer to Section 3-30-5.)

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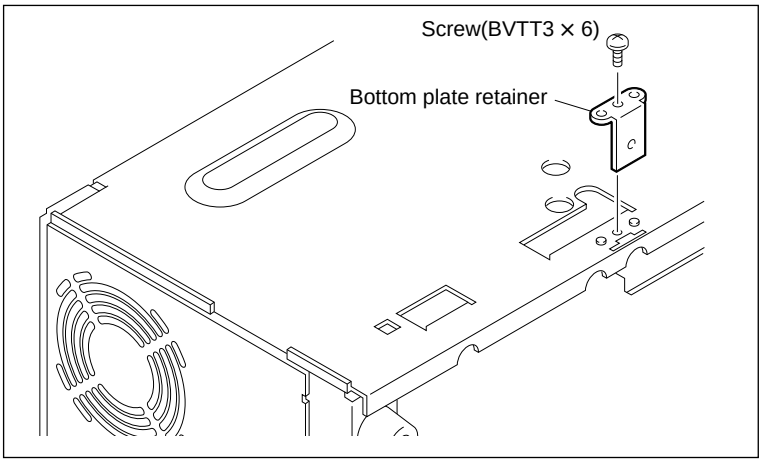
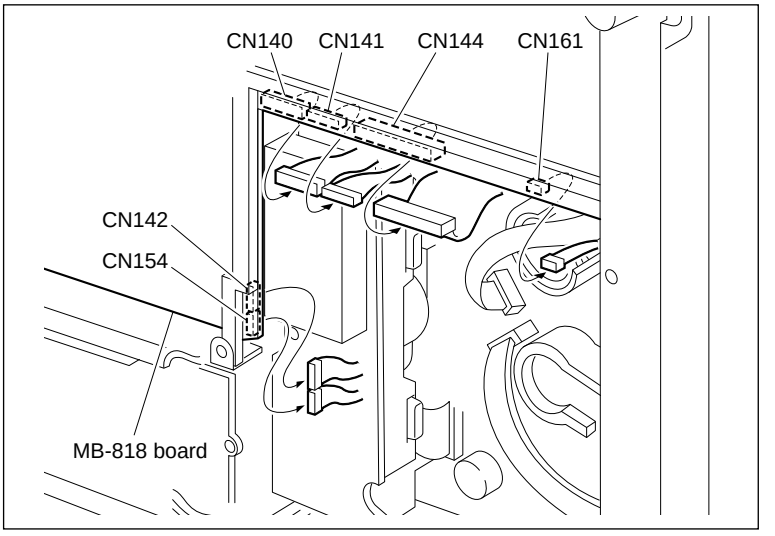
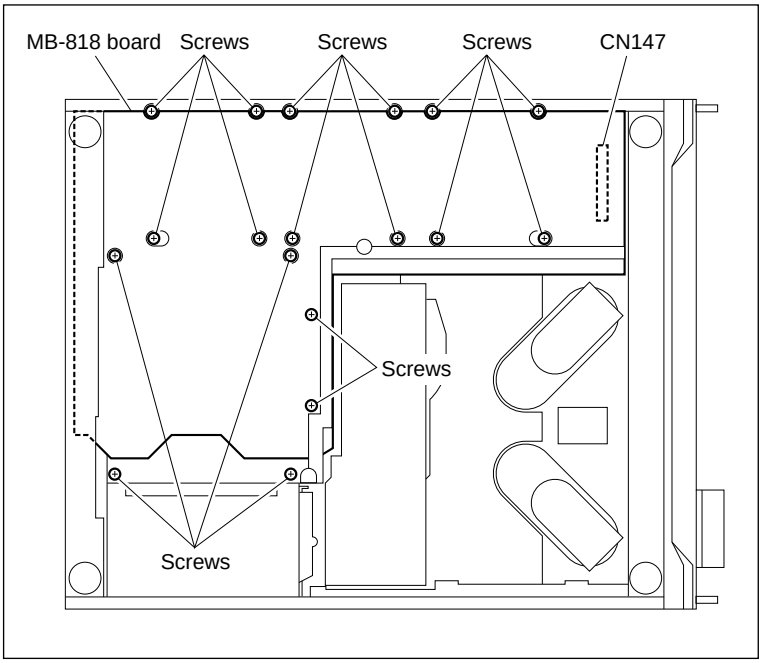
19. Remove the screw and remove the bottom plate retainer.



20. Remove the DT-34D board. (Refer to Section 3-30-5.)
21. Disconnect the harnesses and flat cable from connectors CN140, CN141, CN142, CN144, CN154, and CN161.



22. Remove the eighteen screws and remove the MB-818 board.
23. Disconnect the flat cable from connector CN147 on the MB-818 board.

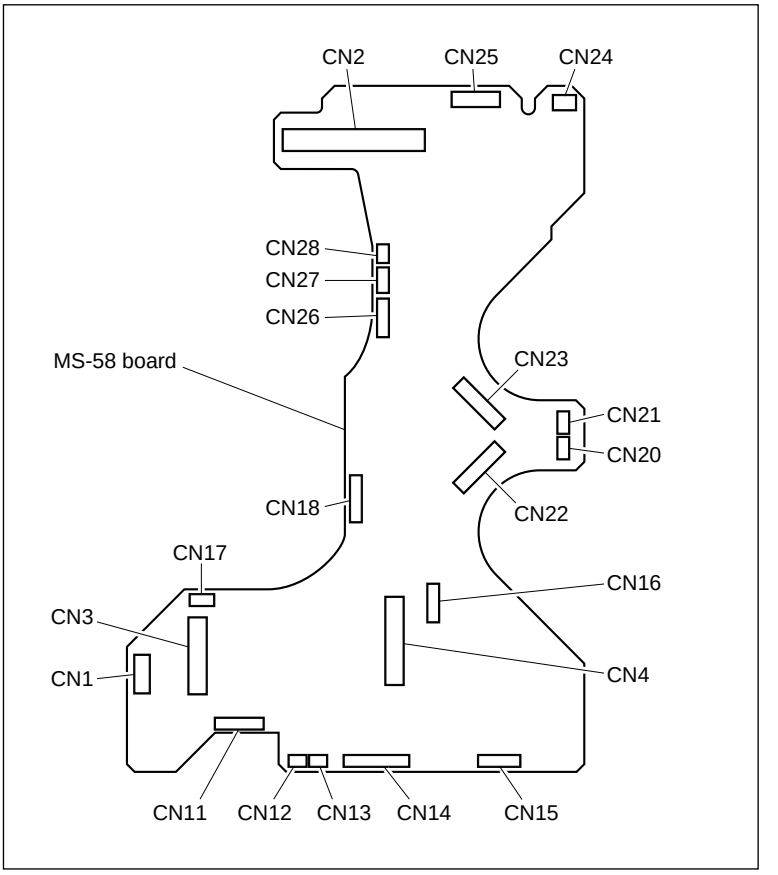


24. Install the MB-818 board in the reverse order of steps 2 through 23.
25. Turn the power on and confirm the unit runs in normal condition.

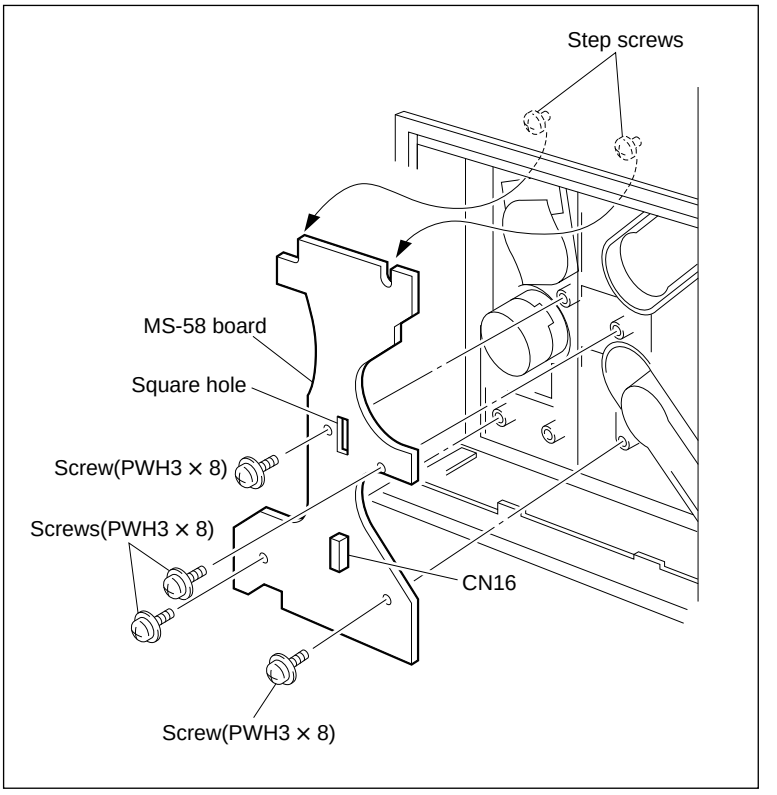
3-30-10. MS-58 Board

Replacement

1. Turn off the power.
2. Remove the DR-315 board.
   (Refer to Section 3-30-6.)
3. Disconnect the harnesses, flat cable or flexible card wires from the connectors CN1, CN2, CN3, CN4, CN11, CN12, CN13, CN14, CN15, CN16, CN17, CN18, CN20, CN21, CN22, CN23, CN24, CN25, CN26, CN27 and CN28 on MS-58 board.



4. Remove the four screws as shown in the figure.
5. Slide the MS-58 board toward the right side panel, and take off the upper side of MS-58 board from the two step screws.



6. Install the MS-58 board in the reverse order of steps 2 to 5.

Note

The MC sensor harness (connected to the connector CN16 on the MS-58 board) requires to thread in the square hole on the center portion of the MS-58 board.

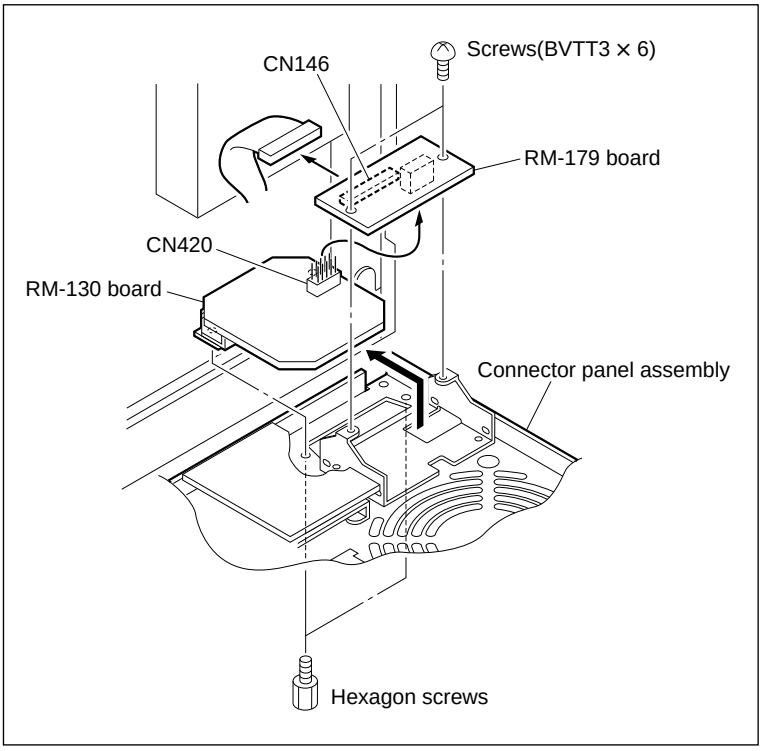
Adjustment after Replacement

7. Perform the whole servo system electrical adjustment.
   (Refer to Section 2-5.)

3-30-11. RM-130/RM-179 Boards

Replacement

1. Turn off the power.
2. Remove the connector panel assembly. (Refer to Section 2-3-3 of the maintenance manual part1.)
3. Disconnect the harness from connector CN146 on the RM-179 board.
4. Remove the two screws, and then remove the RM-179 board from connector CN420 on the RM-130 board.
5. Remove the two hexagon head screws, and then remove the RM-130 board in the direction indicated by the arrow.
6. Install the RM-130 and RM-179 boards in the reverse order of steps 2-5.



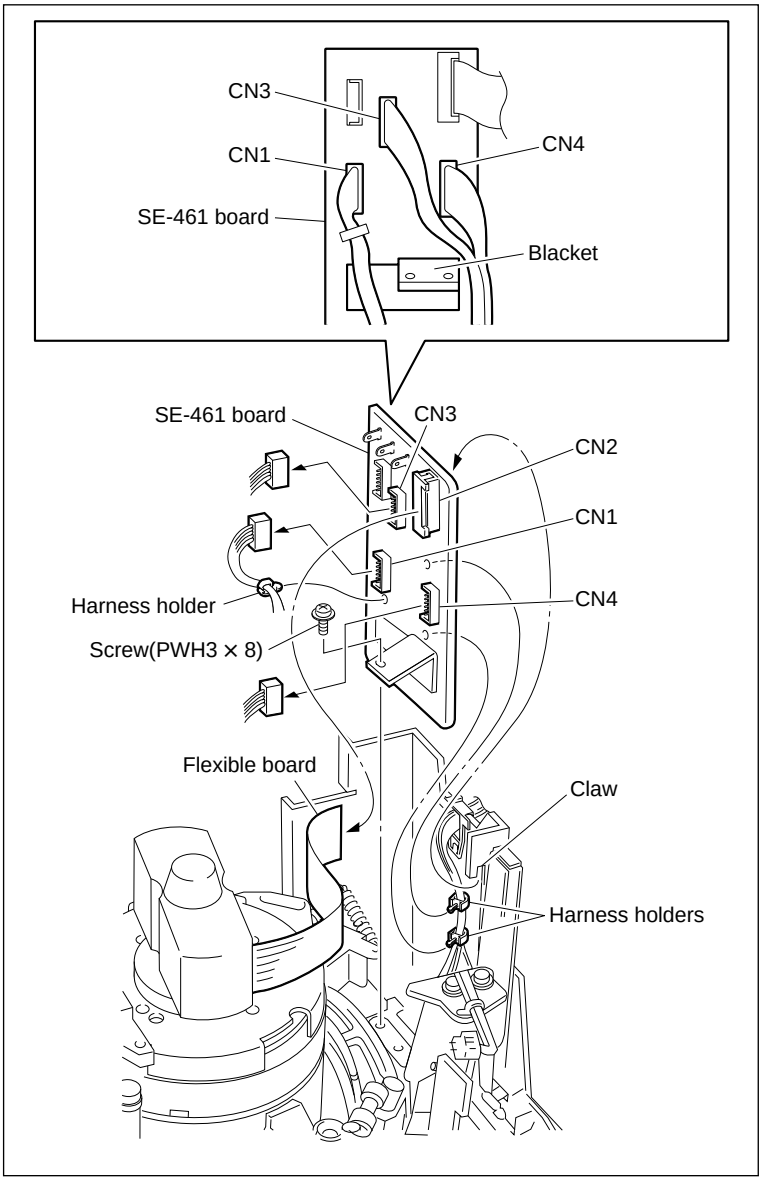
Adjustment after replacement (RM-179 Board)

7. Save the set data. (Refer to Section 1-9-29.)

3-30-12. SE-461 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Disconnect each harness and flexible board from the connector (CN1, CN2, CN3 and CN4) on the SE-461 board.
5. Push out the fastening portion of the three harness holders shown in the figure using a pair of long-nose pliers or etc. from the board, then remove them.
6. Loosen the screw and slide the SE-461 board to unlock from the claw, then remove the SE-461 board.



7. Install the SE-461 board in the reverse order of steps 2, 3, 4, 6, 5.

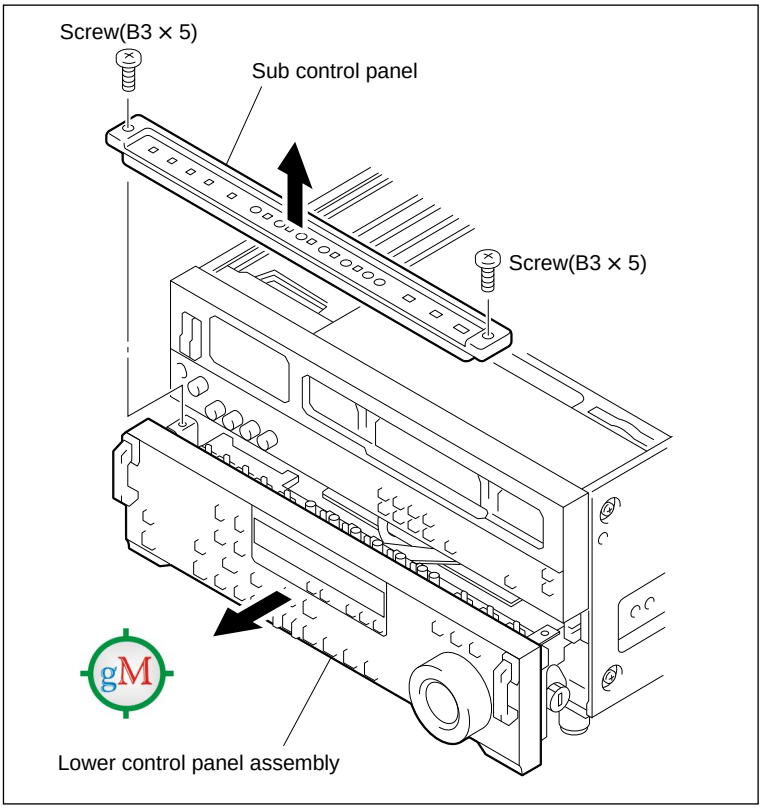
Confirmation after replacement

8. Confirm that the dew sensor functions normally.
   Refer to Section 4-2-2 of the maintenance manual part1.
   (C003: DEW SENSOR)

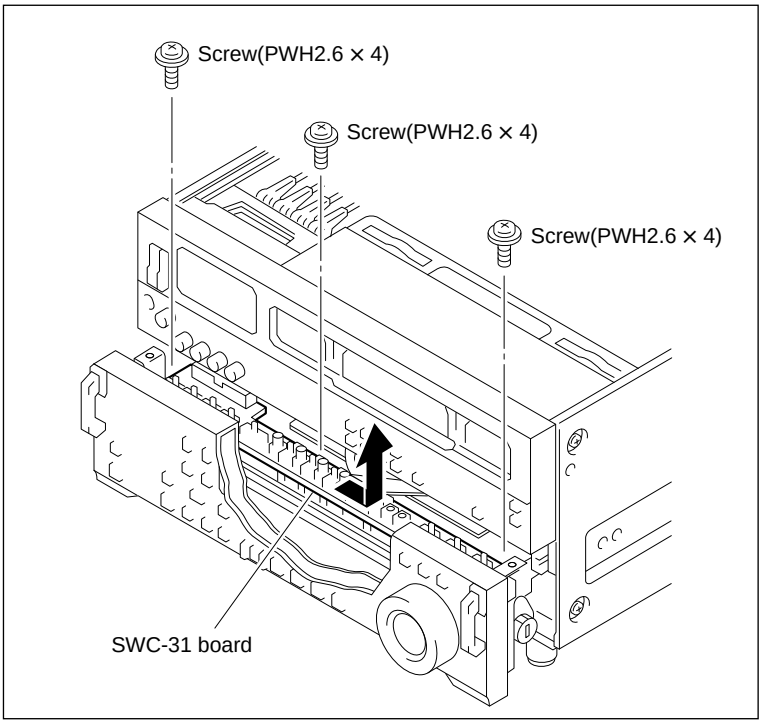
3-30-13. SWC-31 Board

Replacement

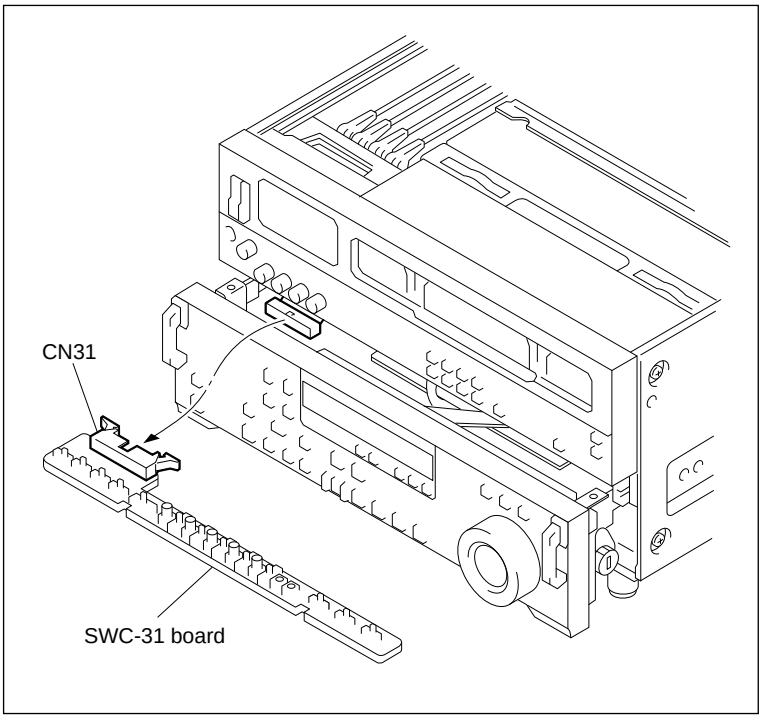
1. Turn off the power.
2. Pull out the lower control panel assembly.
3. Remove the two screws, then remove the sub control panel.



4. Remove the three screws.
5. Unlock the SWC-31 board by sliding it in the direction of the arrow, then remove the board.



6. Disconnect the flat cable from the connector (CN31).
   Then remove the SWC-31 board.



7. Install the SWC-31 board in the reverse order of steps 2 through 6.

Note

Adjustment after replacement is not required.

Note

Perform the system phase adjustment of this unit again according to the maintenance manual of the analog switcher when this unit is used in combination with an analog switcher

.

System phase adjustment

The system phase of this unit is adjusted by using the SYNC control and SC control of SYSTEM PHASE on the sub control panel.

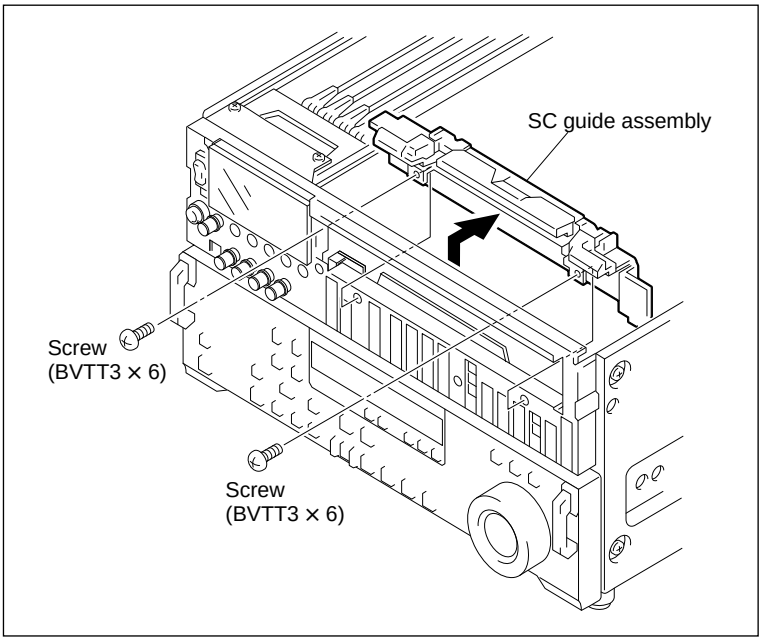
Notes

- Be sure to adjust in PB mode.
  The system phase does not change even if the SYNC/SC control is turned in the REC mode, but it changes when the REC mode is shifted to the PB mode.
- The playback sound may be momentarily in terrupted when the SYNC/SC control is turned during tape playback.

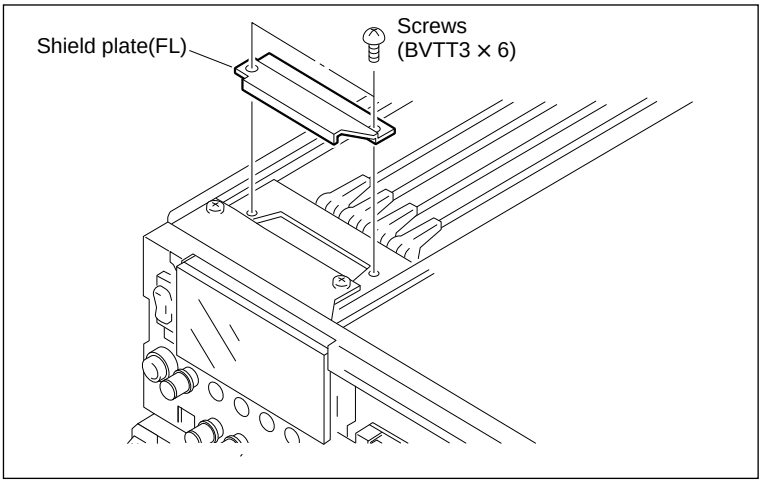
3-30-14. SWC-35 Board

Replacement

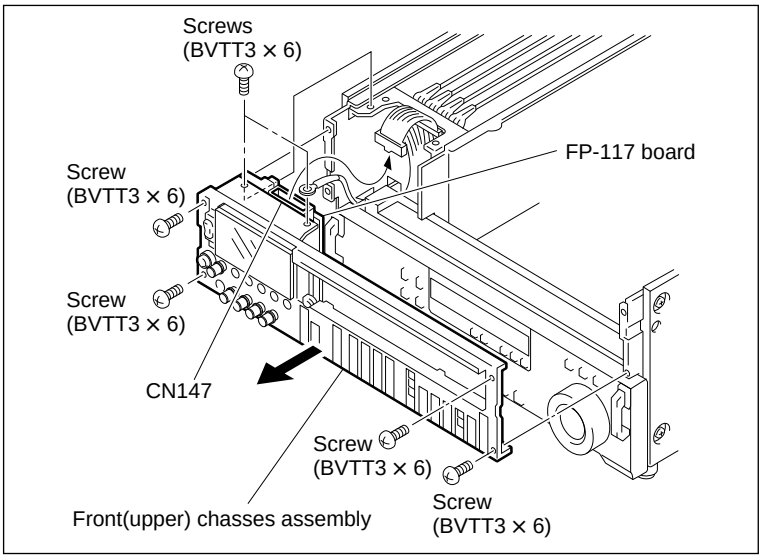
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the two screws, then remove the SC guide assembly.



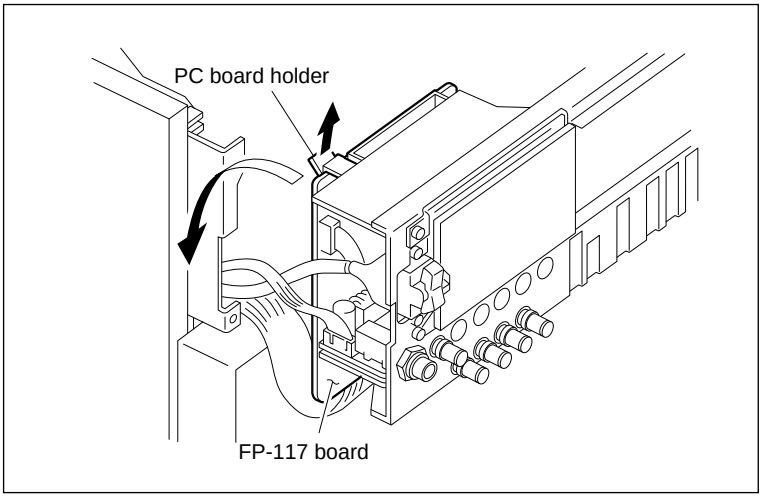
7. Remove the two screws, then remove the shield plate (FL).



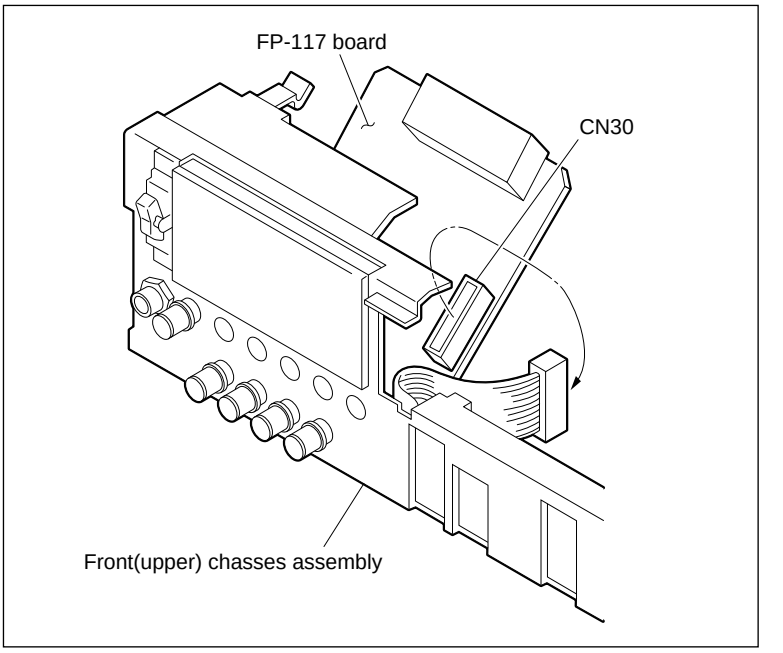
8. Disconnect the flat cable from the connector CN147 on the FP-117 board.
9. Remove the six screws, then pull out the front (upper) chassis assembly.



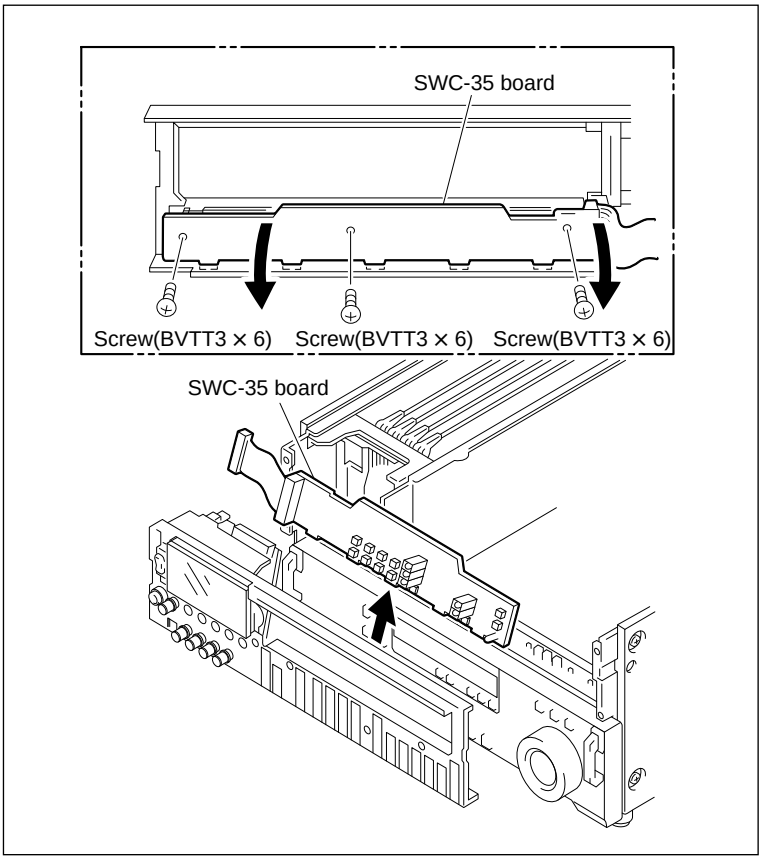
10. Undo the PC board holder, then open the FP-117 board.



11. Disconnect the flat cable from with the connector (CN30) on the FP-117 board.



12. Remove the three screws, then remove the SWC-35 board by lift up the board after inclining to rear.



13. Install the SWC-35 board in the reverse order of steps 2 through 12.

Note

Adjustment after replacement is not required.

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3-30-15. TC-102 Board

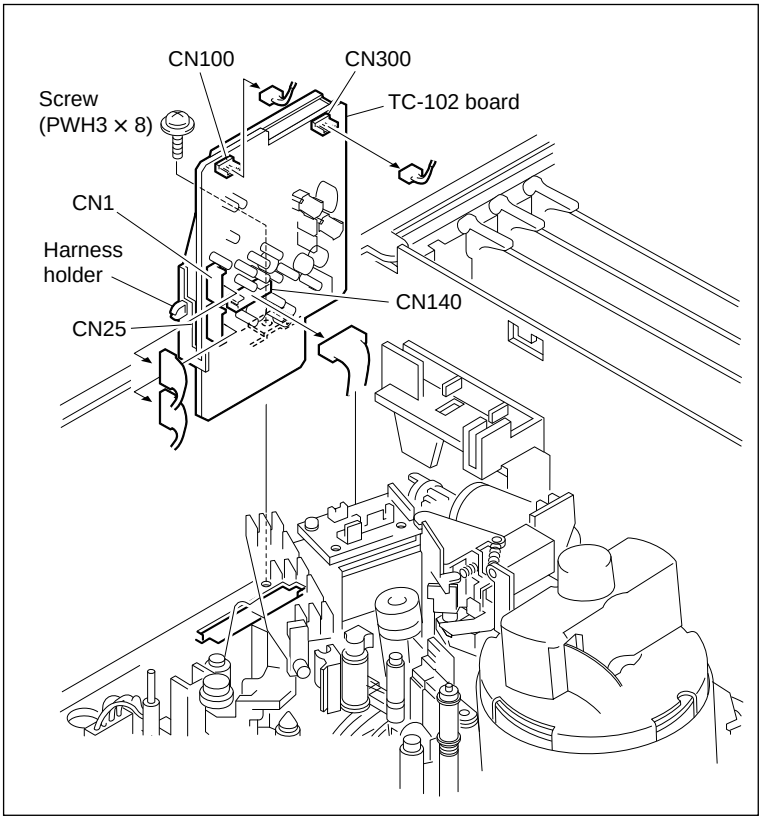
Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the screw as shown in the figure.

   Note

   Pay attention not to fall the screw upon the mechanical deck.

5. Lifting the TC-102 board, and disconnect the harnesses from the connectors (CN100, CN300, CN1, CN25 and CN140) on the TC-102 board.
   Disconnect the CN1 harness from the harness holder.
   Then remove the TC-102 board.



6. Install the TC-102 board in the reverse order of steps 2 through 5.

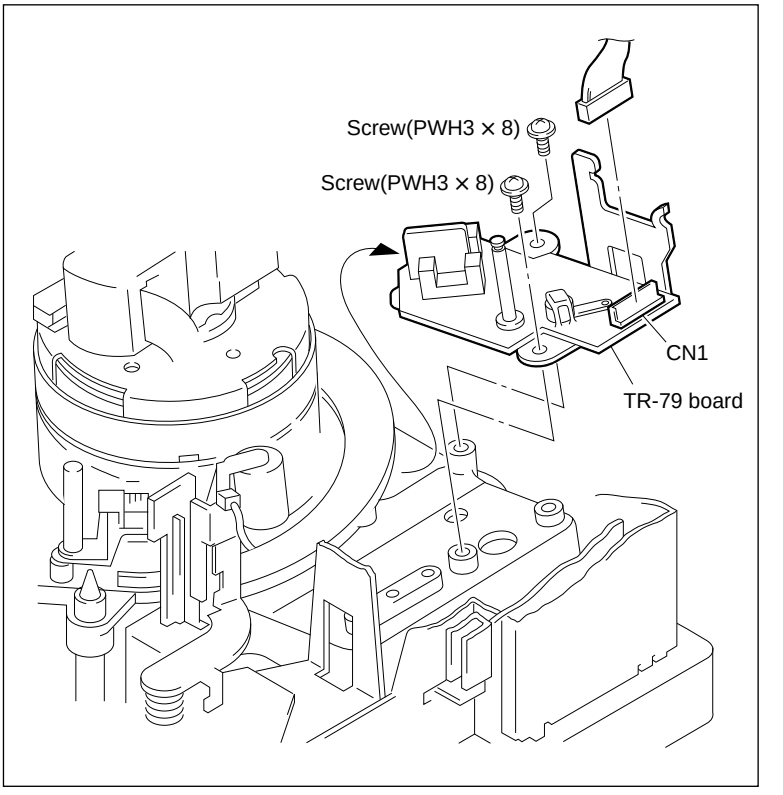
Adjustment after Replacement

7. Perform the time code system adjustment or confirmation.
   (Refer to Section 2-13.)

3-30-16. TR-79 Board

Replacement

1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the T tension arm assembly.
   (Refer to Section 3-24.)
5. Disconnect the harness from the connector (CN1) on the TR-79 board.
6. Remove the two screws, then remove the TR-79 board.



7. Install the TR-79 board in the reverse order of steps 2 through 6.

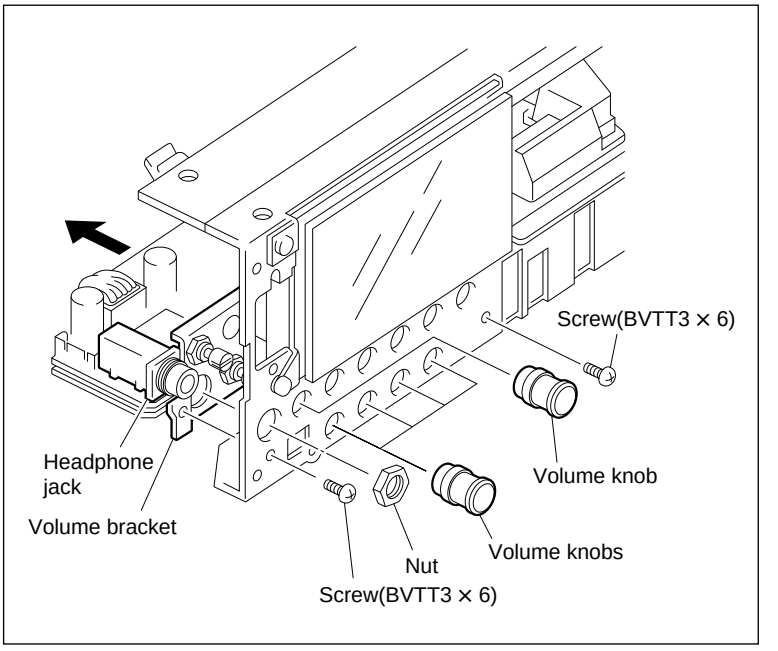
Adjustment after replacement

8. Perform the tension offset adjustment.
   Refer to Section 4-2 of the maintenance manual part1.
   (A008: S/T TENSION OFFSET)

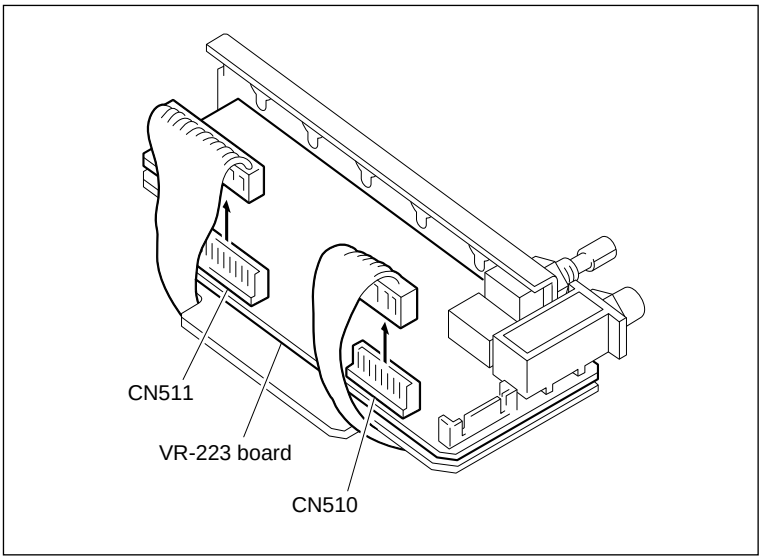
3-30-17. VR-223 Board

Replacement

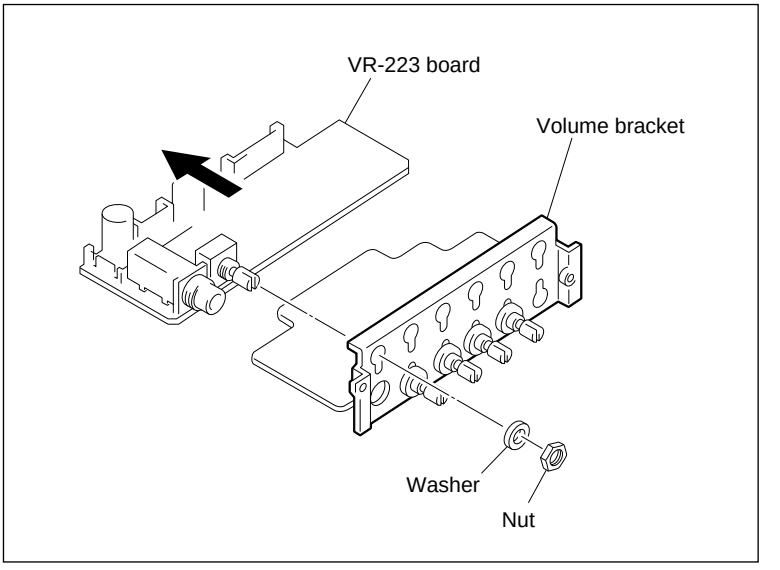
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Remove the five volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the hernesses from the connectors (CN510 and CN511).



11. Remove the nut and washer, and remove the VR-223 board.



12. Install the VR-223 board in the reverse order of steps 2 through 11.

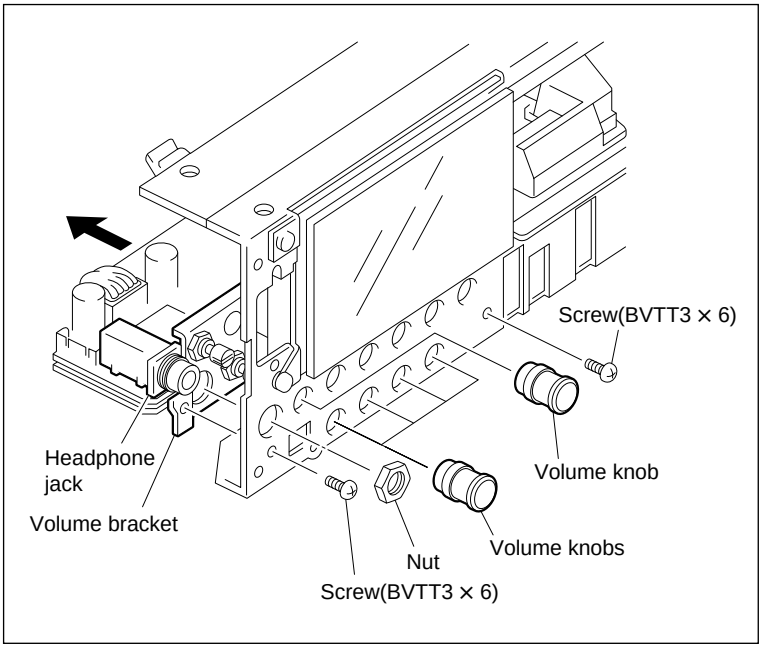
Notes

- After installing the nut, apply locking compound.
- Adjustment after replacement is not required.

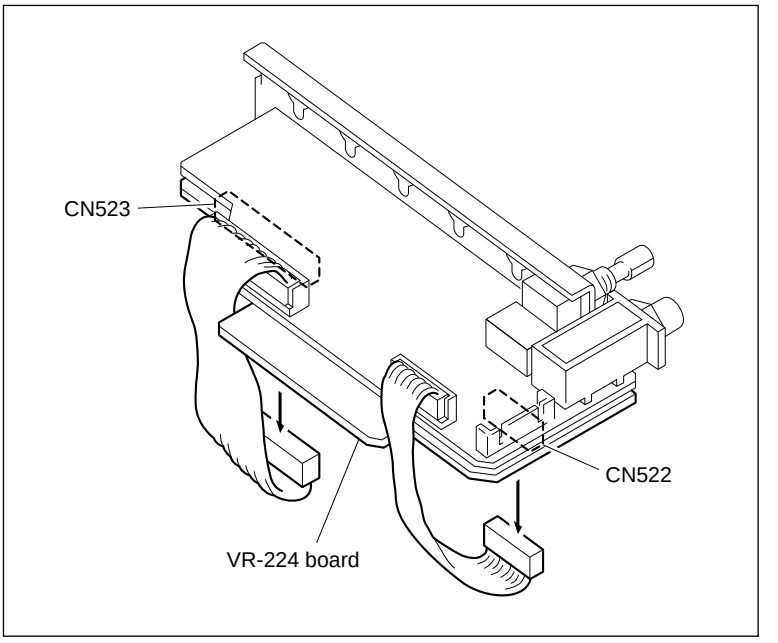
3-30-18. VR-224 Board

Replacement

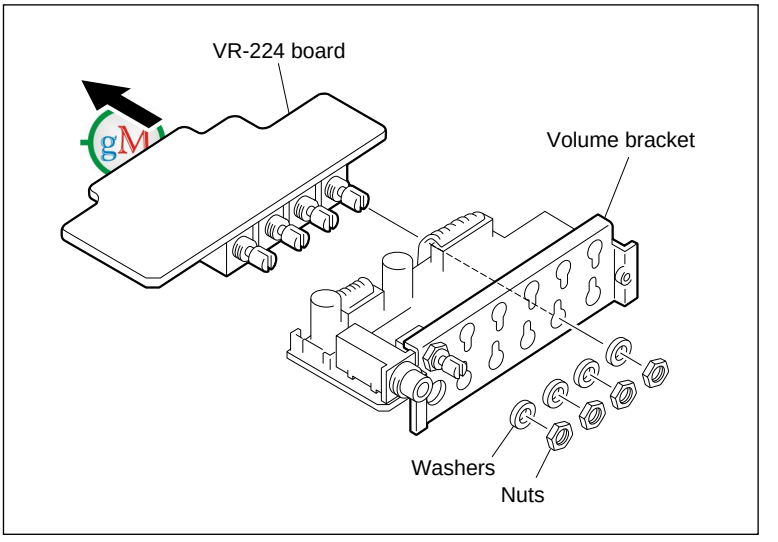
1. Turn off the power.
2. Remove the upper lid.
   (Refer to Section 2-3-1 of the maintenance manual part1.)
3. Remove the plate MD assembly.
   (Refer to Section 2-4 of the maintenance manual part1.)
4. Remove the cassette compartment assembly.
   (Refer to Section 2-5 of the maintenance manual part1.)
5. Remove the upper control panel.
   (Refer to Section 2-3-2 of the maintenance manual part1.)
6. Remove the FP-117 board.
   (Refer to Section 3-30-7.)
7. Remove the five volume knobs.
8. Remove the nut of the headphone jack.
9. Remove the two screws, and remove the volume bracket.



10. Disconnect the harnesses from the connectors (CN522 and CN523).



11. Remove the four nuts and washers, and remove the VR-224 board.



12. Install the VR-224 board in the reverse order of steps 2 through 11.

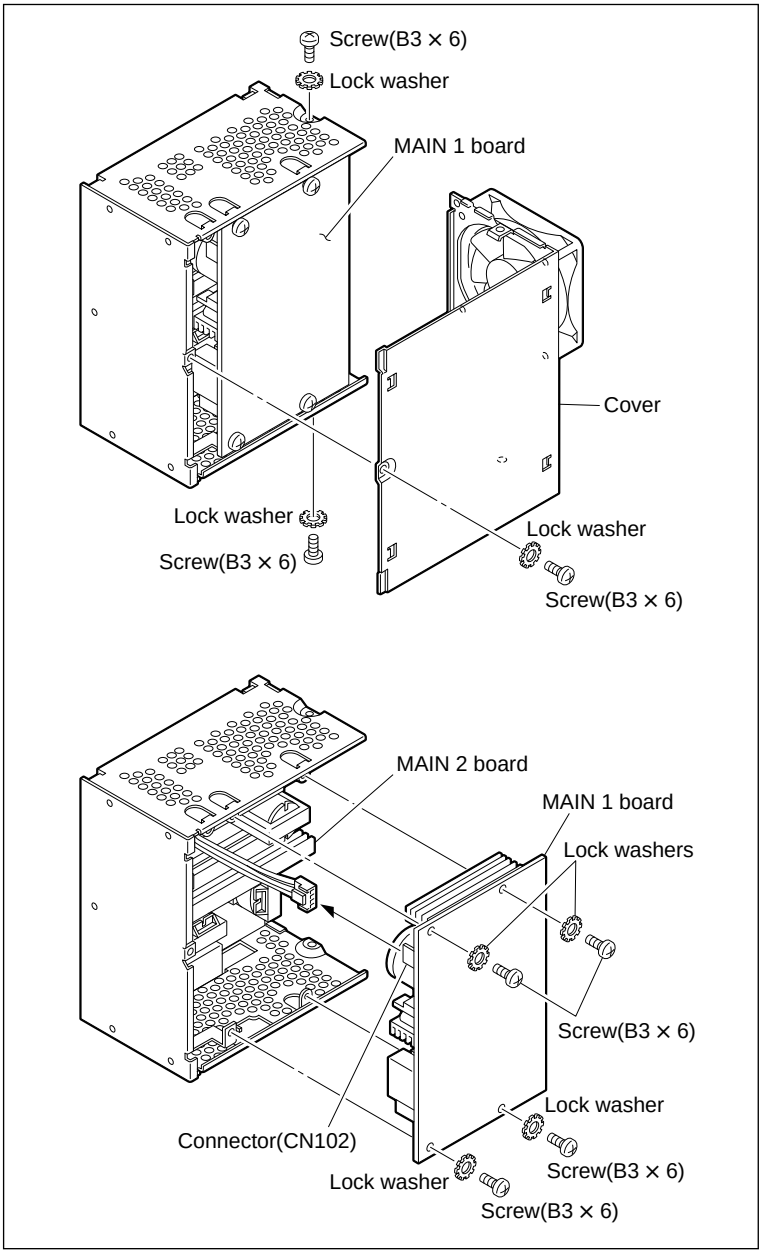
Notes

- After installing the nuts, apply locking compound.
- Adjustment after replacement is not required.

3-31. Board Replacement in Power Supply Unit

Replacement of MAIN 1 board

1. Turn off the power and wait for more than 30 seconds.
2. Remove the power supply unit. (Refer to Section 3-29.)
3. Remove the three screws and lock washers, and then remove the cover.
4. Remove the four screws and lock washers.
5. Disconnect the harness from connector (CN102) and remove the MAIN 1 board.



6. Install the MAIN 1 board in the reverse order of steps 2 to 5.

Note

Replace the whole power supply unit when replacing the MAIN 2 board.

Adjustment after replacement

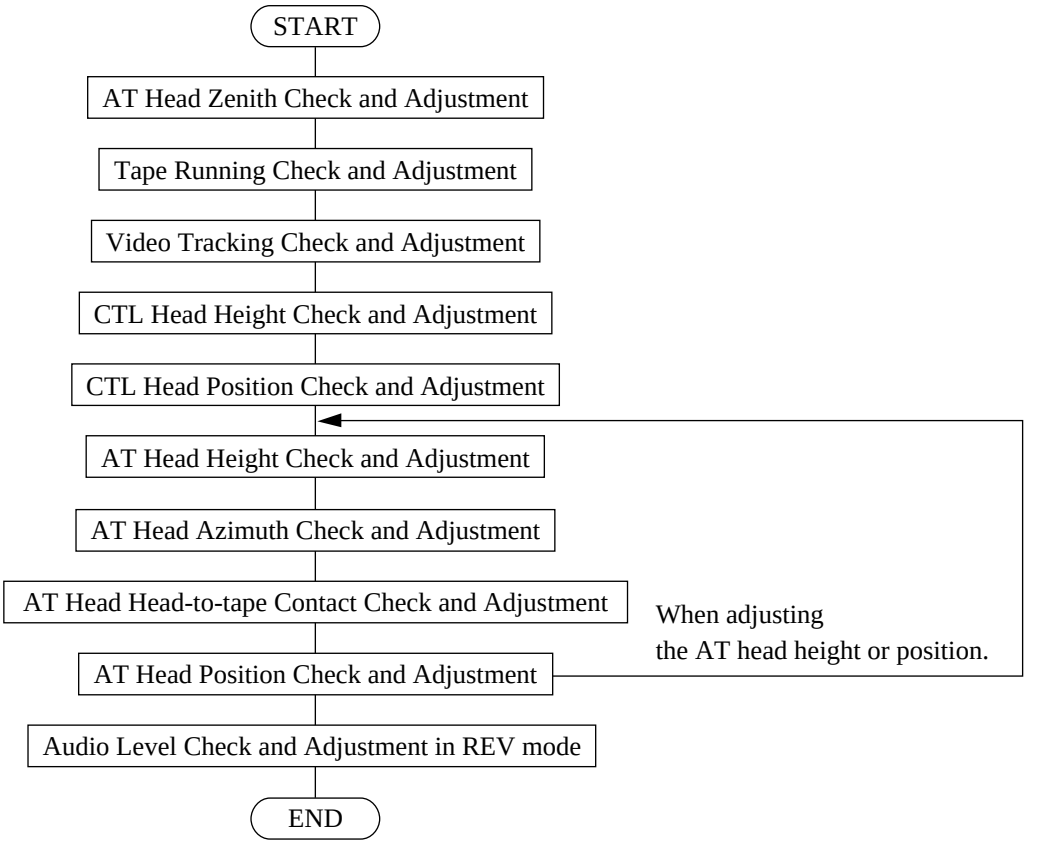
7. Perform the output voltage adjustment. (Refer to Section 2-2-2.)

Section 4
Tape Path Alignment

4-1. Tape Path Adjustment

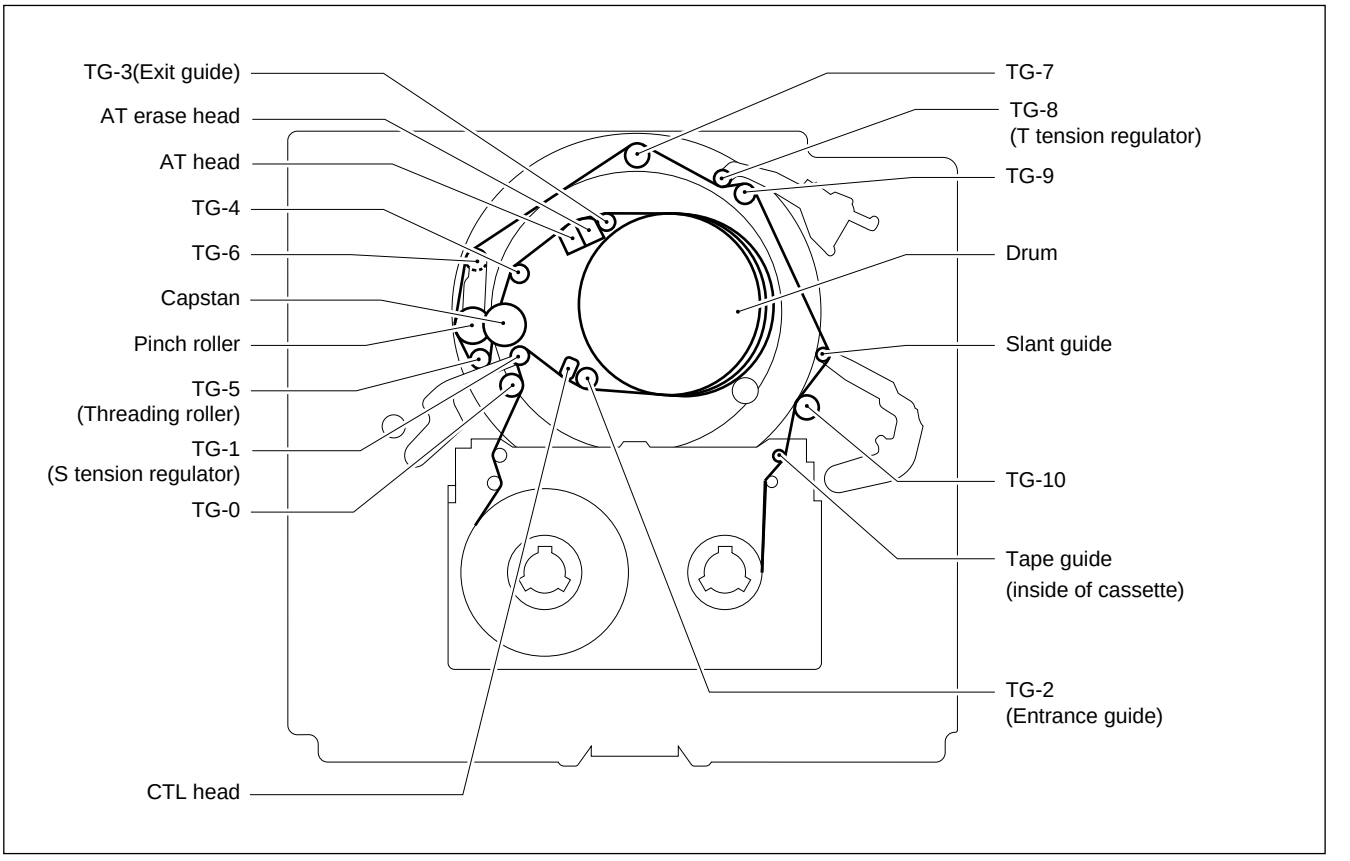
This section describes the checking and adjusting methods of the tape path system such as position, height, and slantness of tape guides and stationary heads.

1. Tape Path Adjustment Flow Chart


START
AT Head Zenith Check and Adjustment
Tape Running Check and Adjustment
Video Tracking Check and Adjustment
CTL Head Height Check and Adjustment
CTL Head Position Check and Adjustment
AT Head Height Check and Adjustment
AT Head Azimuth Check and Adjustment
AT Head Head-to-tape Contact Check and Adjustment
AT Head Position Check and Adjustment
When adjusting
the AT head height or position.
Audio Level Check and Adjustment in REV mode
END

2. Parts Location of the Tape Running System

Following figure describes the names of each part of the tape running system.
It is illustrated in the threading end mode. " TG " in the figure means the tape guide.



3. Cassette Compartment

- The tape path adjustment should be performed under the state that the cassette compertment is removed. If not, some checks and adjustments may be impossible.
- When the tape path adjustment is performed with the cassette compartment removed, the tape protection circuit is activated and the "ERROR" message may be displayed. In this case, turn the power off, then turn it on again.

4. Cassette Tape

The tape path adjustment is performed after the cassette compertment removal.
Then, it is necessary to make a modification to the cassette tape and alignment tape that are used for tape path adjustment as follows.

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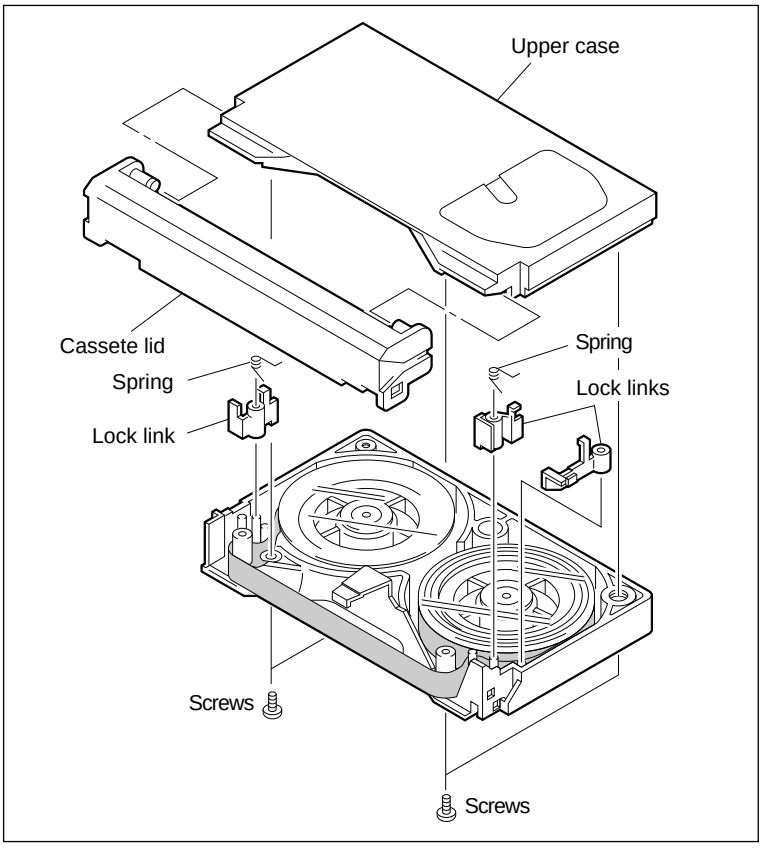
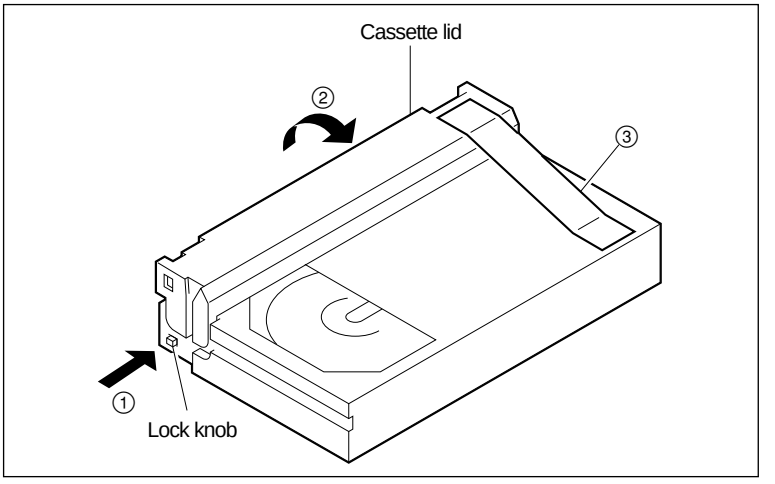
(1) Cassette tape without lid
Disassembly the cassette tape, and take off the cassette lid, lock links and springs shown in the figure.



(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①) and fix the cassette lid using an adhesive tape (③).



When setting the cassette tape or the alignment tape on the VTR, put it to the cassette supports on the mechanical deck. And then, put a weight on the cassette so that it does not rise up. The weight about 1000 g is suitable.

5. Tracking Control

The method of the tracking control in the playing back mode is described below.
(1) Set a cassette tape and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.
(2) Push the PLAY button, then the tape is played back.
(3) Push S100 switch on the SS-83 board more than 1 sec..
In this state, RV100 variable resistor on the SS-83 board becomes the tracking control volume (and the LED D112 lights).
When the EJECT button is pushed or S100 switch on the SS-83 board is pushed more than 1 sec. after adjustment, the tracking control is fixed.

6. Preparation

(1) Remove the cassette compartment.
(Refer to Section 2-5 of the maintenance manual part 1.)
(2) Remove the video head cleaner.
(Refer to Section 3-5.)

Note

If the video head cleaner is installed, the tape running condition may be difficult to check. Therefore, remove the video head cleaner assembly before checking.

(3) Clean the following portions :
- Tape running surface of upper drum and heads
(Refer to Section 5-2-3 of the maintenance manual part 1.)
- Lower drum's tape running surface and lead surface
(Refer to Section 5-2-4 of the maintenance manual part 1.)
- Stationary heads (Refer to Section 5-2-5 of the maintenance manual part 1.)
- Tape running system and tape cleaner
(Refer to Section 5-2-6 of the maintenance manual part 1.)

7. Alignment Tape

(1) SR2-1 (For 525/60 system) : 8-960-075-11
SR2-1P (For 625/50 system) : 8-960-075-61

- Contents:

Time min. sec.	CTL track	AUX track	Video/Audio track	Use
00 : 00 ⇧ (PULSE) ⇩ 15 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	3.212 MHz (A CH only)	• Video Tracking Adjustment • CTL Head Position Adjustment • AT Head Height Adjustment (for camcorder) • AT Head Position Adjustment
20 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	A CH: 3.212 MHz B CH: 6.424 MHz	
25 : 00	CTL	3 kHz, 0 VU (SR2-1) 3.15 kHz, 0 VU (SR2-1P)	12.848 MHz (ALL CH)	
27 : 00	CTL	————	100 % Color Bars	• Drum PG Phase Automatic Adjustment

* CTL head height adjustment can be performed at any portion of this alignment tape.
* When the pulse portion (00:00 to 15:00) is played back, the displayed TC data is interpolated by CTL signal due to no recording on the time code track.

(2) CR2-1B (For DNW-A65) : 8-960-096-01
CR2-1B PS (For DNW-A65P) : 8-960-096-51

- Contents:

Time min. sec.	Video track	AFM	TC	Use
00 : 00 28 : 00	Y : 4 MHz C : 5 MHz	————	7 : 3 pulse	• Video Tracking Check (Betacam/Betacam SP) • Y/C Head Head-to-Tape Contact Check

* The displayed TC data is interpolated by CTL signal due to the duty 7 : 3 pulse is recoded on the time code track.

(3) CR8-1A (For DNW-A65) : 8-960-097-45
CR8-1A PS (For DNW-A65P) : 8-960-098-45

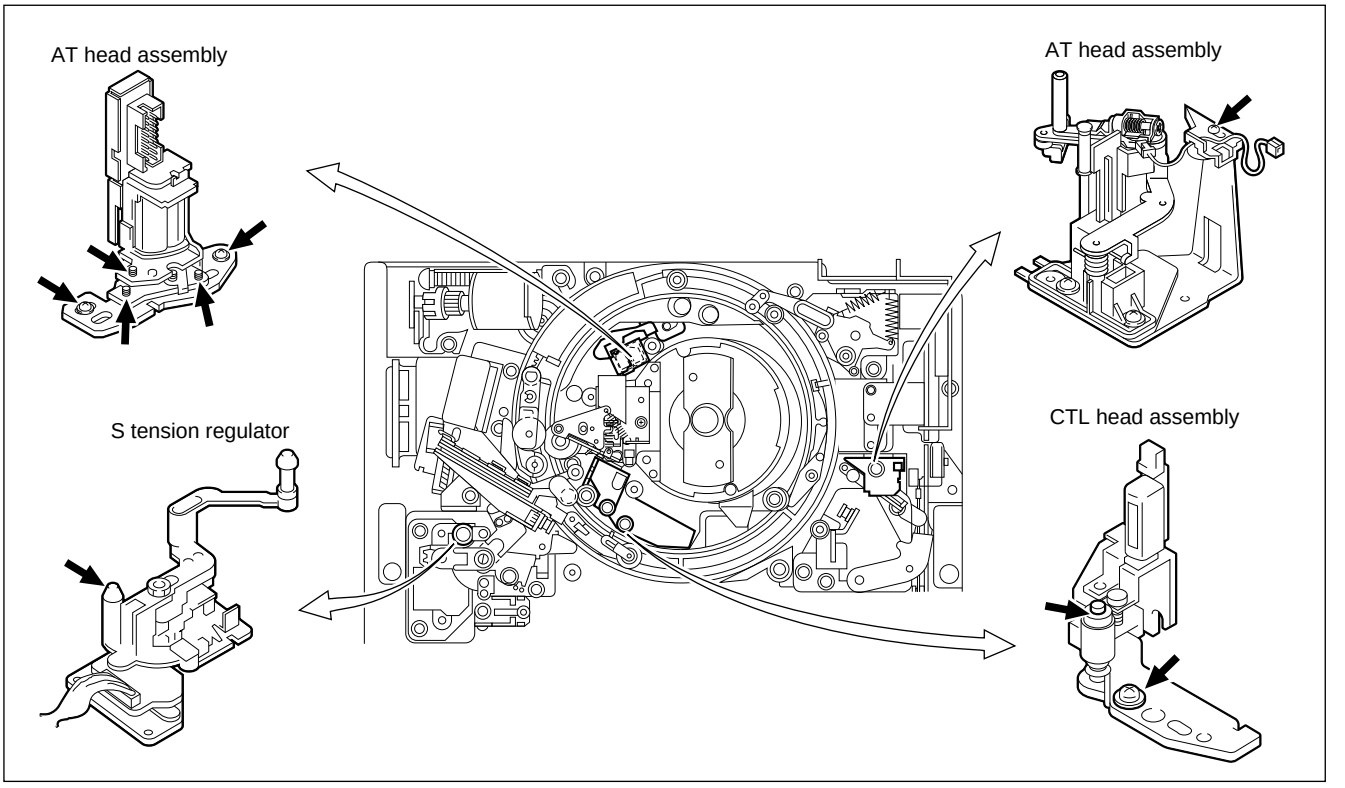
• Contents:

Time min. sec.	Audio track	Video track	CTL track	Use
00 : 00	1 kHz, 0 VU	————	CTL	
02 : 55	Blank			
03: 00	10 kHz, –10 VU	————	CTL	• AT Head Azimuth Adjustment • AT Head Head-to-tape Contact Adjustment
04 : 55	Blank			
05 : 00	1 kHz, –20 VU	————	CTL	
05 : 55	Blank			
06 : 00	40 Hz, –20 VU 7 kHz, –20 VU 10 kHz, –20 VU 15 kHz, –20 VU	————	CTL	
07 : 55	Blank			
08 : 00	1 kHz, 0 VU	————	1 kHz, 0 VU Sine Wave	• AT Head Height Adjustment • Audio Level Check in REV Mode
10 : 00				

8. Locking Compound

When loosening the following screws, apply locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off with gauze or soft cloth.

• Locking compound : 7-432-114-11



4-1-1. AT Head Zenith Check and Adjustment

Note

The AT head zenith check and adjustment are required only when the AT head is replaced.

Tools

- Flatness plate (SL-657): J-6086-570-A
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

Check

1. Unthreading End Mode

Check that the unit is in the unthreading end mode.

2. Check the AT Head Zenith

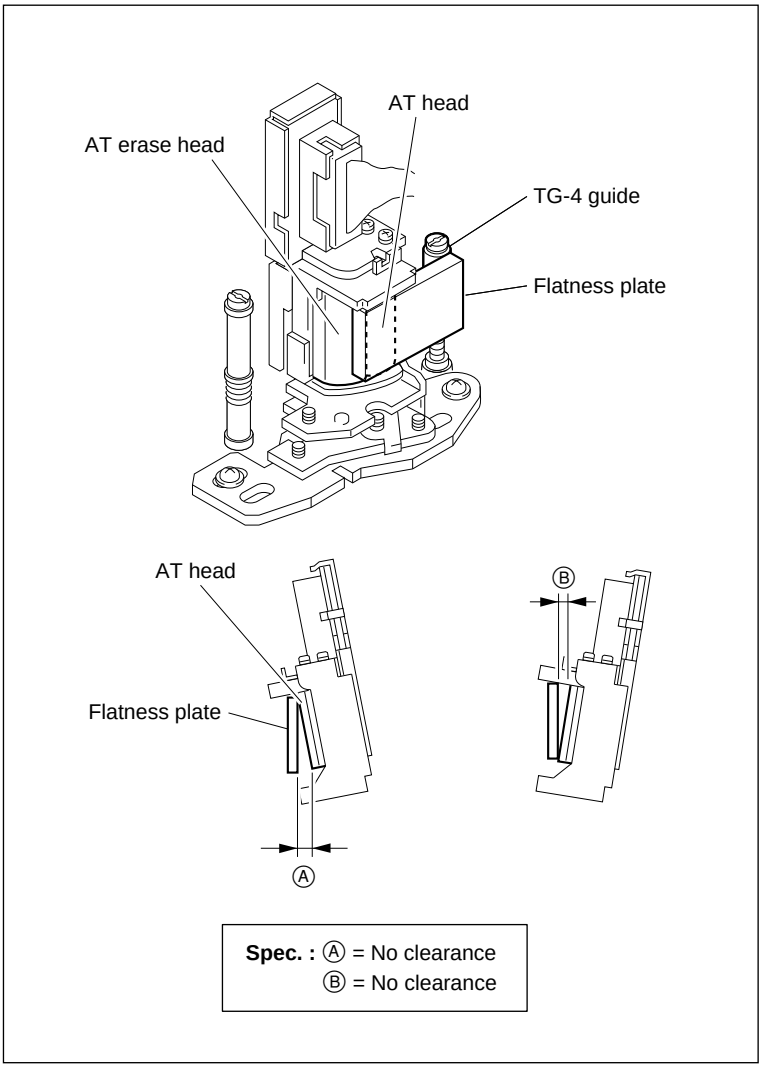
(1) Place the flatness plate lightly against the TG-4 guide and AT head.

Note

Be careful not to damage the surface of the AT head and TG-4 guide.

(2) Check that no clearance exists between the AT head and flatness plate as TG-4 guide reference in step (1).

If the specification is not satisfied, perform steps 3 and later.
If it is satisfied, perform step 7.



AT Head Zenith Check

Adjustment

3. Remove the CL Guide Rail

Remove the two screws, then remove the CL guide rail.

4. In Case of Clearance Exists at the Upper Part (Fig. 1)

Turn the zenith adjustment screw counterclockwise to satisfy the specification.

5. In Case of Clearance Exists at the Lower Part (Fig. 2)

Turn the zenith adjustment screw clockwise to satisfy the specification.

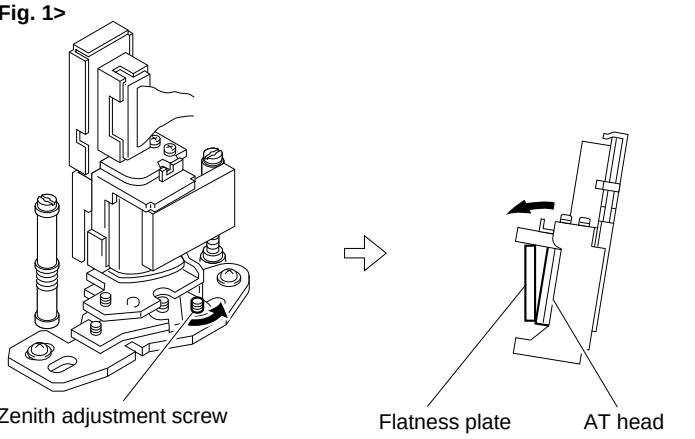
6. Install the CL Guide Rail

Install the CL guide rail with two screws.

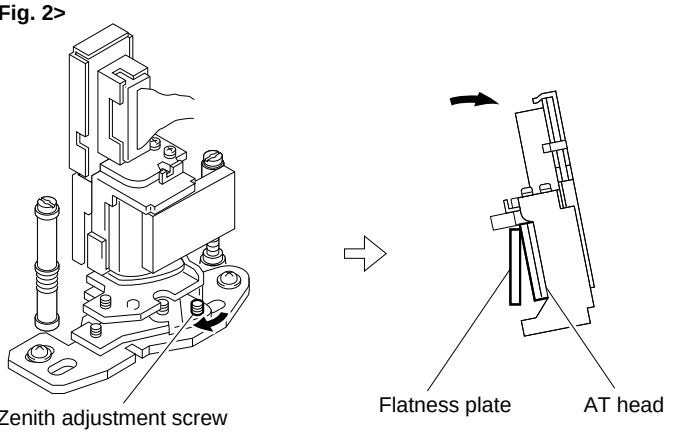
7. Cleaning

Clean the surface of the AT head, AT erase head, and TG-4 guide with a cleaning cloth moistened with cleaning fluid.

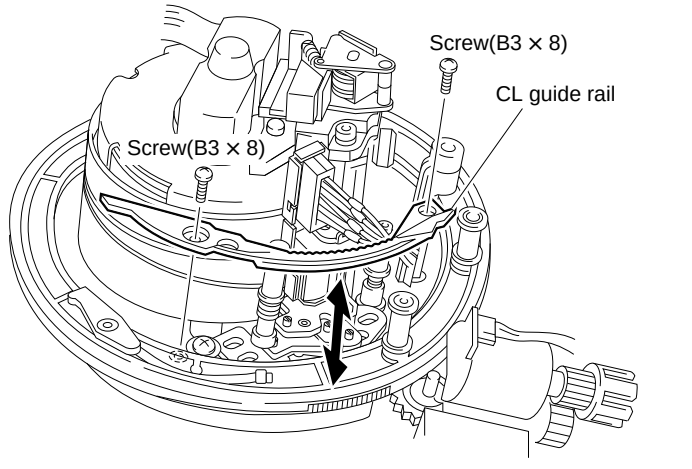
<Fig. 1>



<Fig. 2>



・Removal/Installation of the CL Guide Rail



AT Head Zenith Adjustment

4-1-2. Tape Running Check and Adjustment

Note

The tape running is closely related to the height of the S and T reel tables. Check the height of the S and T reel tables before this tape running check and adjustment. (Refer to Section 3-15-4.)

Tape Entrance Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the RS table block assembly in the S cassette position. (Refer to Section 3-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

4. REV × 10 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

5. F. FWD Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

6. REW Mode

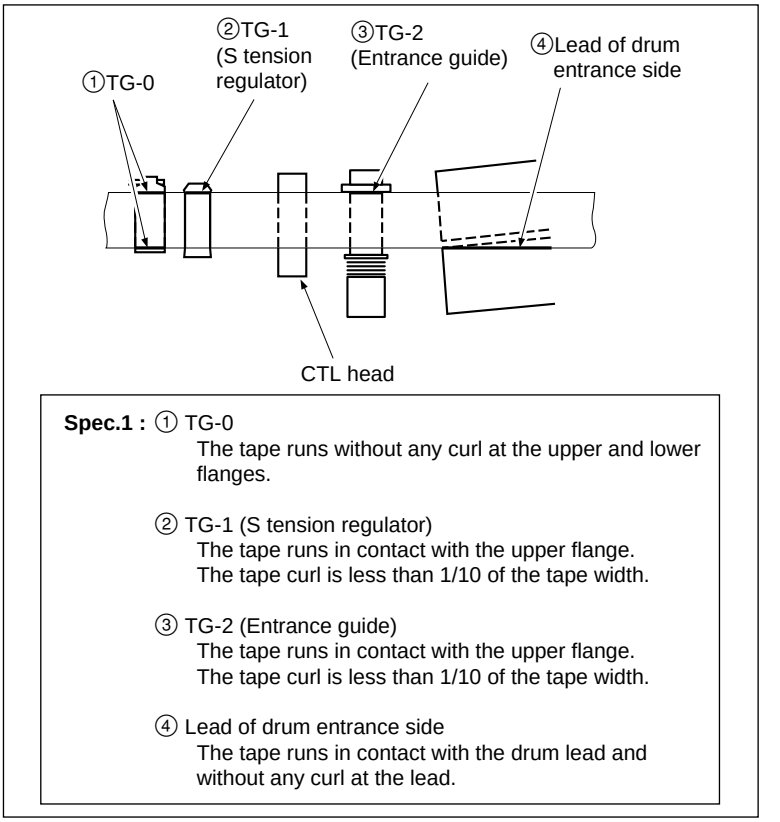
Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

7. REV × 1 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.

8. VAR × −1/30 Mode

Check that the tape running condition satisfies specification 1.
If specification 1 is not satisfied, perform steps 9 and 10.


①TG-0
②TG-1
(S tension
regulator)
③TG-2
(Entrance guide)
④Lead of drum
entrance side
CTL head
Spec.1 : ① TG-0
The tape runs without any curl at the upper and lower flanges.
② TG-1 (S tension regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
③ TG-2 (Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.
④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl at the lead.

Tape Running Check at Tape Entrance Side

Adjustment

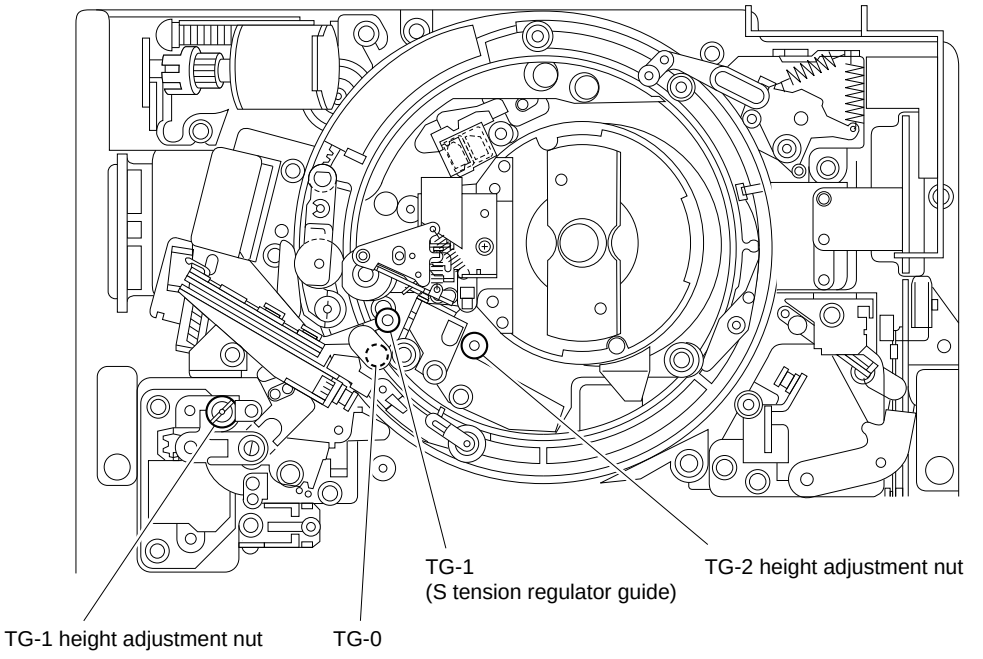
9. Adjust the TG-1 and TG-2 Height

(1) Put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-1 and TG-2 using a tape guide adjustment driver and adjust the height of TG-1 and TG-2 so that the specification 1 is satisfied.

10. Recheck the Tape Running at Tape Entrance Side

Perform the tape running check refer to steps 3 through 8, and perform the video tracking adjustment (Refer to Section 4-1-3).

If the specification 1 is not satisfied, perform the adjustment in step 9 again.



Tape Running Adjustment at Tape Entrance Side

Tape Exit Side

Tools

- Betacam cassette (S cassette): BCT-30MA
- Betacam cassette (L cassette) : BCT-90MLA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Check

1. Set the S Cassette Tape

(1) Place the reel tables in the S cassette position. (Refer to Section 3-1-3.)
(2) Set the S cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

2. Turn the Power On

3. PLAY Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

4. REV × 10 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

5 F. FWD Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

6. REW Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

7. REV × 1 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 12 and 14.

8. VAR × –1/30 Mode

Check that the tape running condition satisfies specification 2.
If specification 2 is not satisfied, perform steps 13 and 14.

9. Set the L Cassette Tape

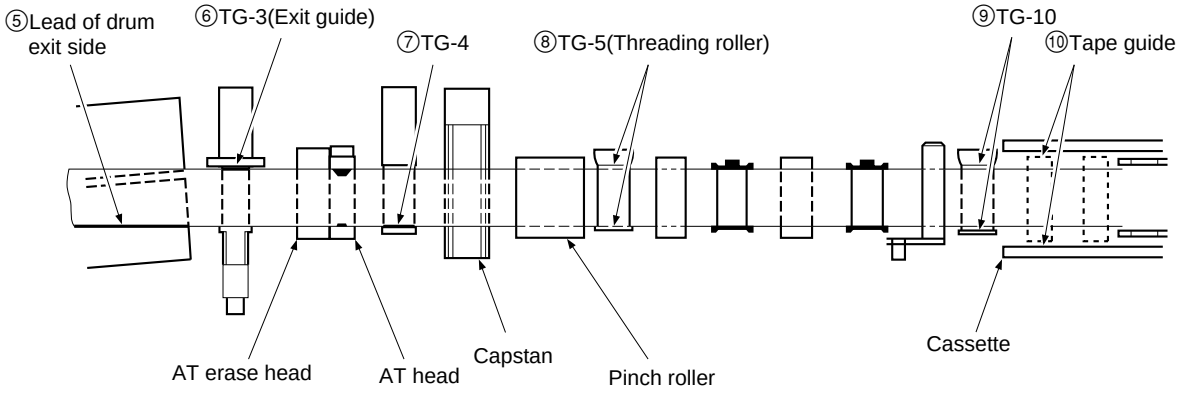
(1) Remove the S cassette.
(2) Press S100 switch (D-1/side A) on the SS-83 board and place the reel tables in the L cassette position.
(3) Set the L cassette and put a weight on the cassette so that it does not rise up. Weight about 1000 g is suitable.

10. Play Back the Tape

Play back the tape beginning portion of the L cassette.

11. Check the Tape Running at the T Tape Guide of Cassette and TG-10.

Check that the tape running condition satisfies specification 3 at TG-10 and the T tape guide of the L cassette.
If specification 3 is not satisfied, perform step 15.



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Spec.3 : Play mode
⑨ TG-10
The tape runs not in contact with the upper and lower flanges.

⑩ Take-up side tape guide of cassette
The tape runs without any curl at the upper and lower portions of the tape guide.

Tape Running Check at Tape Exit Side

Adjustment

12. Adjust the TG-3 (Exit Guide) and TG-4 Height

(1) Set the S cassette and put the unit into the PLAY mode.
(2) Turn the height adjustment nuts of TG-3 and TG-4 using a tape guide adjustment driver and adjust the height of TG-3 and TG-4 so that the specification 2 is satisfied.
(3) Perform the video tracking adjustment (Refer to Section 4-1-3).

13. Adjust the TG-5 (Threading Roller) Height (only when the specification is not satisfied in REV × 10 mode and VAR × –1/30 mode)

(1) Push the EJECT button.
(2) Remove the cassette tape.
(3) Turn the upper flange of TG-5 using a tape guide adjustment driver and adjust the height of TG-5 so that the specification 2 is satisfied.
(4) Set the S cassette tape and put the unit into the REV × 10 mode or VAR × −1/30 mode. At this time, check that the tape running condition satisfies specification 2.

    If it is not satisfied, repeat steps (1) through (4) mentioned above.

14. Recheck the Tape Running at Tape Exit Side

Perform steps 2 through 8 again.

If the specification 2 is not satisfied, perform the adjustment in step 12 again.
(If the specification 2 is not satisfied in REV × 10 mode or VAR ×−1/30 mode, perform the adjustment in step 13 again.)

15. Adjust the Slant Guide Slantness

(1) Loosen the fixing screw of the adjustment plate by 1/4 to 1/2 turn.
(2) Insert a 3 mm flatbladed screwdriver into the notch of the adjustment plate.
(3) Turn the screwdriver to adjust the slantness of the slant guide so that specification 3 is satisfied.
(4) Tighten the screw loosened in step (1).
(5) Recheck that specification 3 is satisfied referring to steps 9 through 11.

    If it is not satisfied, repeat steps (1) through (5) mentioned above.

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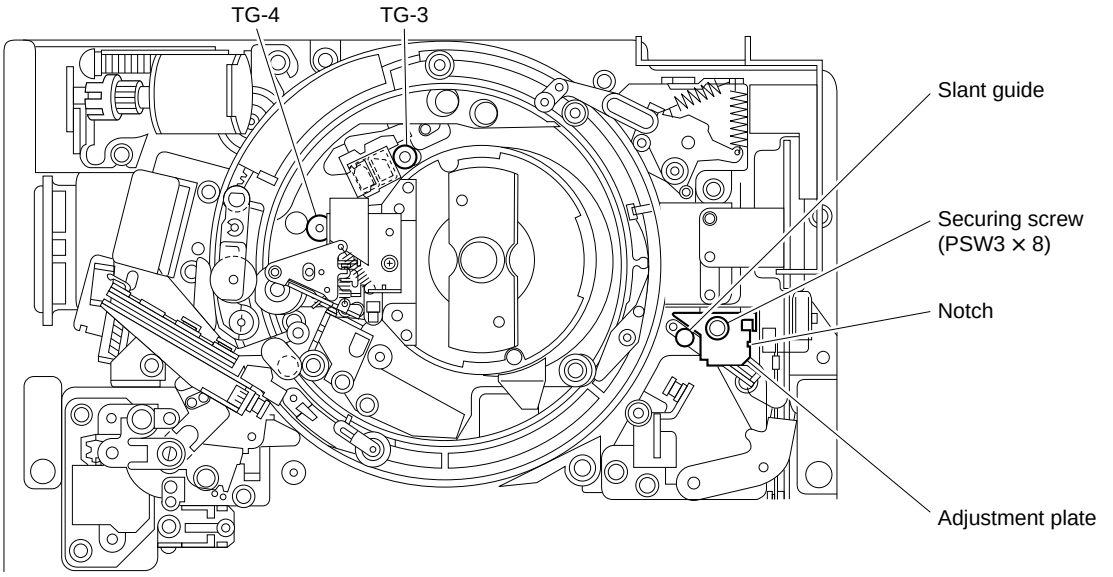
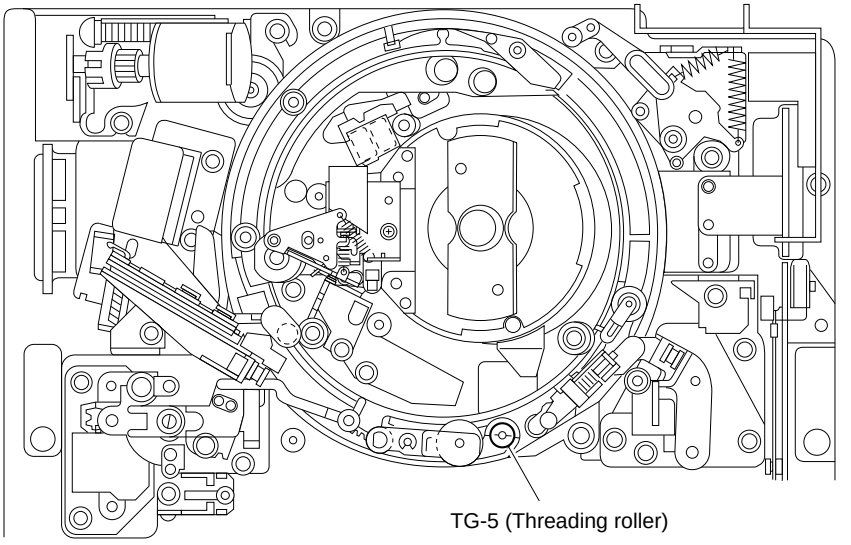
・TG-3 and TG-4 height adjustment/slant guide slantness adjustment



・TG-5 Height adjustment (Only when the specification is not satisfied in REV × 10 mode or VAR × –1/30 mode)

<Unthreading end mode>



Tape Running Adjustment at Tape Exit Side

4-1-3. Video Tracking Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Alignment tape CR2-1B (For DNW-A75): 8-960-096-01
- Alignment tape CR2-1B PS (For DNW-A75P): 8-960-096-51

- Oscilloscope (Tektronix 2465B or equivalent)
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP100/EQ-75 board (A1A5 SEL signal)
TRIG: TP325/SS-83 board (SS GOP signal)

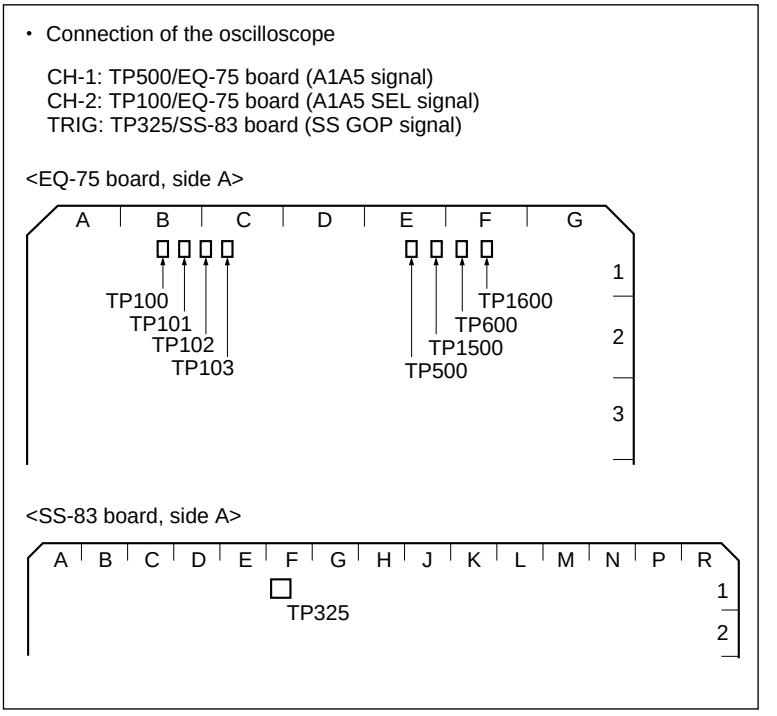
Oscilloscope setting:
CH-1: 200 mV/DIV
CH-2: 5 V/DIV
TIME: 2 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

Check

4. Turn the Power On



Preparation

5. Check the PB Head Head-to-tape Contact

(1) Play back the SR2-1/P (20:00 to 25:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
The waveform is displayed on the oscilloscope as shown in the figure.
(3) Turn the tracking VR so that the output level of the center portion of RF waveform of A1 channel is maximized.
(4) Check that RF waveform of A1 channel satisfies the spec.1 in a state of procedure (3).
(5) Maximize the output level of RF waveform of A5 channel, check that RF waveform of A5 channel satisfies the spec.1.
(6) Change the connections of CH-1 and CH-2 of the oscilloscope as follows, and perform the check from procedures (1) through (5) in the same way.

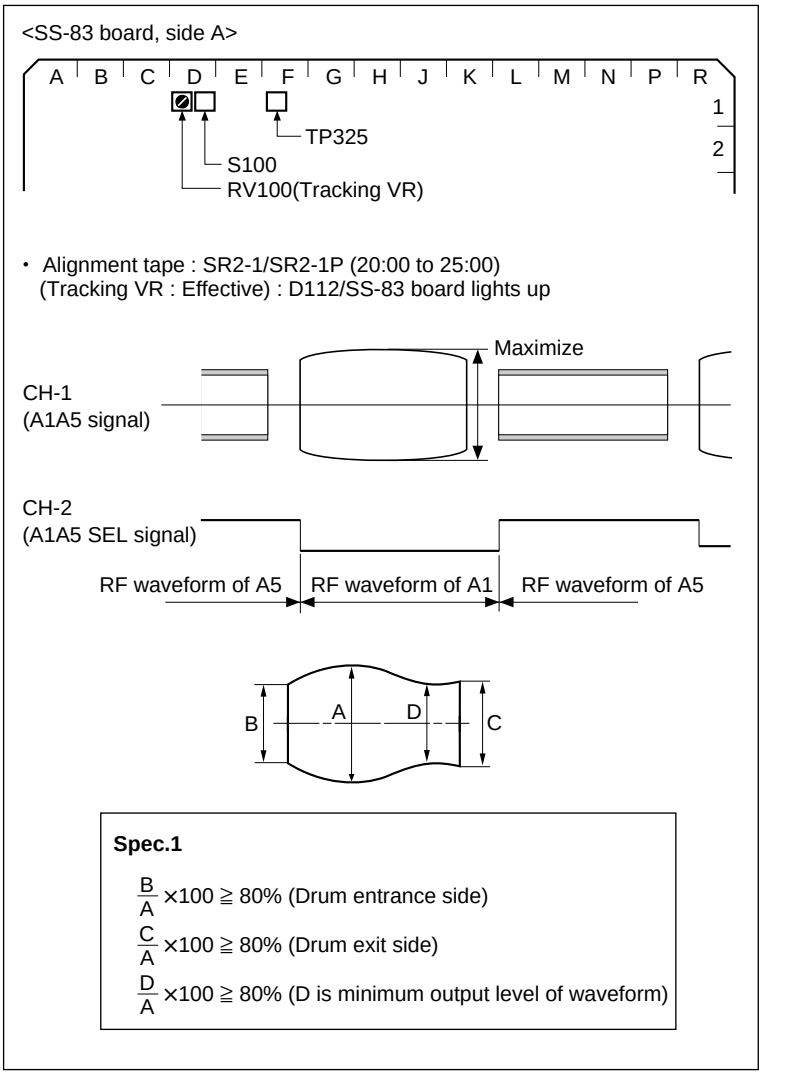
- CH-1: TP500, CH-2: TP100
- CH-1: TP600, CH-2: TP102
- CH-1: TP1500, CH-2: TP100
- CH-1: TP1600, CH-2: TP102

(All of these TPs are on the EQ-75 board.)

Note

The signal that is output from each TP is as shown below.

TP100 (A1A5 SEL signal)
TP102 (A2A6 SEL signal)
TP500 (A1A5 signal)
TP600 (A2A6 signal)
TP1500 (B1B5 signal)
TP1600 (B2B6 signal)



PB Head Head -to-tape Contact Check

6. Check the Y/C Head Head-to-tape Contact

(1) Connect the oscilloscope.
CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP1500/EQ-75 board (B1B5 signal)
TRIG: TP100/EQ-75 board (A1A5 SEL signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 to 2 ms/DIV

Note

The Ya and Yb signals of Betacam/Betacam SP are output from TP500 under playing back the CR2-1B/PS. In the same way, the Ca and Cb signals are output from TP1500.

(2) Press the EJECT button so that the unit put into the unthreading end state and remove the SR2-1/P.
At the same time, the tracking VR becomes to be not effective.
LED: Check that D112/SS-83 board lights out.

(3) Set the CR2-1B/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

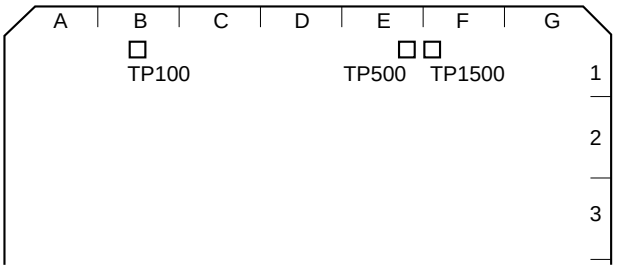
(4) Press the PLAY button to play back the CR2-1B/PS. (Any portion playback is acceptable)
The waveform is displayed on the oscilloscope as shown in the figure.

(5) Check that the RF waveform of Ya, Yb and the RF waveform of Ca, Cb satisfy the specification 2.

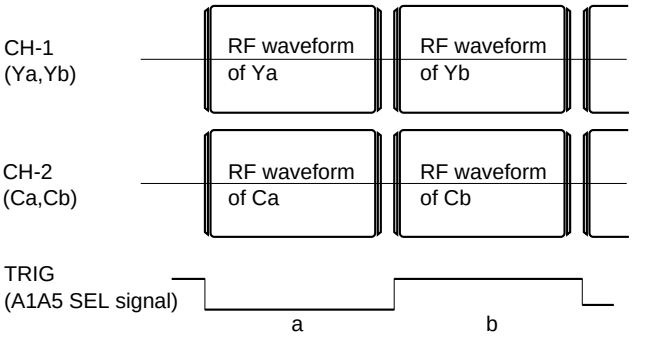
・ Connection of the oscilloscope

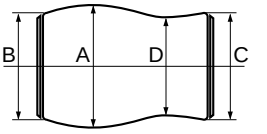
CH-1: TP500/EQ-75 board (A1A5 signal)
CH-2: TP1500/EQ-75 board (B1B5 signal)
TRIG: TP100/EQ-75 board (A1A5 SEL signal)

<EQ-75 board, side A>



・ Alignment tape : CR2-1B/CR2-1B PS (Any portion)
(Tracking VR : Not effective) : D112/SS-83 board lights out





Spec.2

$\frac{B}{A} \times 100 \geqq 80\%$ (Drum entrance side)

$\frac{C}{A} \times 100 \geqq 80\%$ (Drum exit side)

$\frac{D}{A} \times 100 \geqq 80\%$ (D is minimum output level of waveform)

Y/C Head Head-to-tape Contact Check

7. Mode Setting (PB Head Play Back)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.
(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "A4: MECHANISM ADJUST" and press the SET button.
(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.
Then, □ mark is indicated at the right up corner on the monitor.

Note

Refer to Section 4 of Maintenance Manual Part 1 "Maintenance Mode" for more information about the maintenance mode.

8. PLAY Mode

(1) Connect the oscilloscope.
CH-1: TP106/SS-83 board
(AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting:
CH-1: 200 mV/DIV
TRIG: 5 V/DIV
TIME: 1 ms/DIV

(2) Play back the SR2-1/P (00:00 to 15:00).

(3) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112/SS-83 board lights up.

(4) Turn the tracking VR so that the output level of RF envelope waveform is maximized.

(5) Turn RV100 on the SS-83 board clockwise so that the center portion of the RF envelope waveform makes 80% of the maximum output level.

(6) At the state of (5), check that the RF envelope waveform satisfies specification 4.

Note

If the level fluctuates, read the average level.

(7) If the level fluctuates, turn RV100 on the SS-83 board so that the output level in the center portion of the RF envelope waveform is maximum, and check that the fluctuation amounts satisfy specification 5.

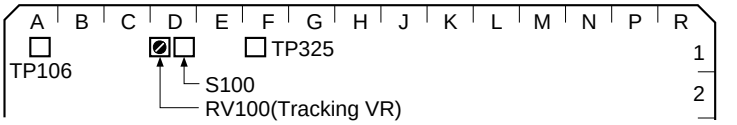
If specifications 4 and 5 are not satisfied, perform the adjustment (at the Tape Entrance Side or the Tape Exit Side) in steps 11 and later.

– Continued on the next page. –

• Connection of the oscilloscope

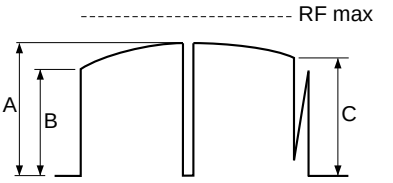
CH-1 : TP106/SS-83 board (AB EVEN ENV signal)
TRIG : TP325/SS-83 board (SS GOP signal)

<SS-83 board, side A>



• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Head-to-tape contact>



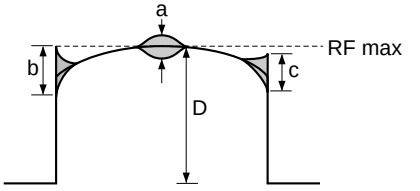
A = RF max × 0.8

Spec.4 : $\frac{B}{A} \times 100 \geqq 70\%$

$\frac{C}{A} \times 100 \geqq 70\%$

(Output levels (B and C) at the tape entrance side and exit side are more than 70% of the center level(A).)

<Fluctuation>



D = Average maximum level at waveform center

Spec.5 : $\frac{a}{D} \times 100 \leqq 20\%$

$\frac{b}{D} \times 100 \leqq 20\%$

$\frac{c}{D} \times 100 \leqq 20\%$

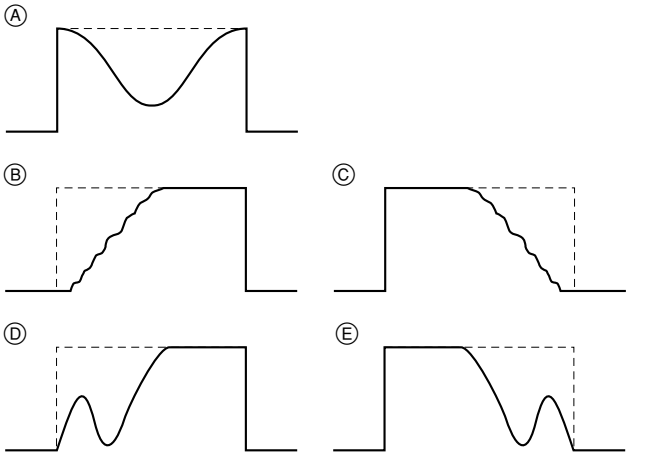
(Fluctuation amounts (a, b, c) at the drum center portion, entrance side and exit side are less than 20% of the average maximum level (D).)

If the output waveform is extremely abnormal condition as shown in Fig.1 after replacing the upper drum assembly, perform the upper drum replacement again.

- Upper drum assembly replacement
  (Refer to Section 3-2.)

<Fig. 1>

- Abnormal waveform (For example)



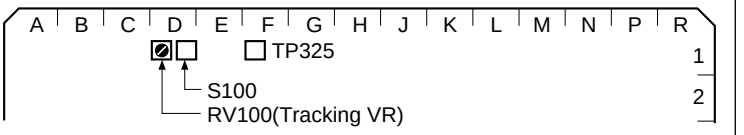
Video Tracking Check (PLAY)

9. F. FWD and REW Mode

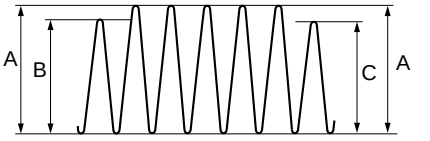
(1) Press the PLAY button and play back the SR2-1/P (00:00 to 15:00).
(2) Put the unit into the F. FWD mode and check that the RF waveform satisfies specifications 6 and 7.
(3) Put the unit into the REW mode and check that the RF waveform satisfies specifications 6 and 7.

If specifications 6 and 7 are not satisfied, perform the adjustment (at the Tape Entrance Side or Tape Exit Side) in steps 11 and later.

<SS-83 board, side A>



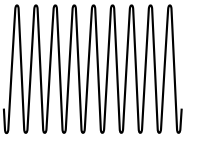
- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective) : D112/SS-83 board lights out



Spec.6 : $\frac{B}{A} \times 100 \geqq 70\%$ (Tape entrance side)
$\frac{C}{A} \times 100 \geqq 70\%$ (Tape exit side)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective) : D112/SS-83 board lights out

Spec.7 : No waveform lacking exists.



Video Tracking Check (F. FWD, REW)

10. REW Mode to PLAY Mode

(1) Play back the SR2-1/P (00:00 to 15:00).

(2) Put the unit into the REW mode once. Two or three seconds later, put the unit into the PLAY mode.

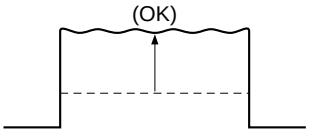
Check that the RF envelope waveform satisfies the specification 8.

- In case of the waveform become A, B or C Check that the output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up (Spec. 9)

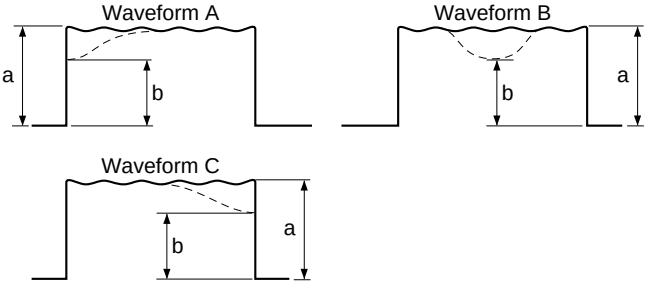
If specification 9 is not satisfied in waveform A or B shown in the figure, check the tape running at the tape entrance side. (Refer to Section 4-1-2.)

If specification 9 is not satisfied in waveform C shown in the figure, check the tape running at the tape exit side. (Refer to Section 4-1-2.)

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Not effective)



Spec.8 : The RF envelope waveform returns to the maximum level with the even level within 1 second after servo locks up (Servo lamp on the control panel lights up).



Spec.9 : The output level (b) is more than 70% of the level in normal PLAY mode (a) and returns it to the level in normal PLAY mode within 1 second after servo locks up.

Video Tracking Check (REW ⇨ PLAY)

Adjustment

Tape Entrance Side

11. Adjust the Tracking at Tape Entrance Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform makes 80% of the maximum output level.
(4) Loosen the height adjustment nut of TG-2, and turn the upper flange so that the tape does not in contact with the upper flange of TG-2.
(5) Turn the height adjustment nut of TG-1 so that the RF envelope waveform makes flat. (Fig. 1)

If the waveform does not make flat, perform the check described below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of Maintenance Manual Part 1.)
② Press down the tape by bamboo stick very lightly and check that the tape is running along the drum lead.

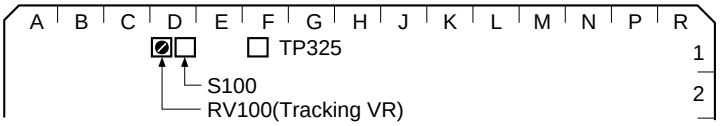
Note

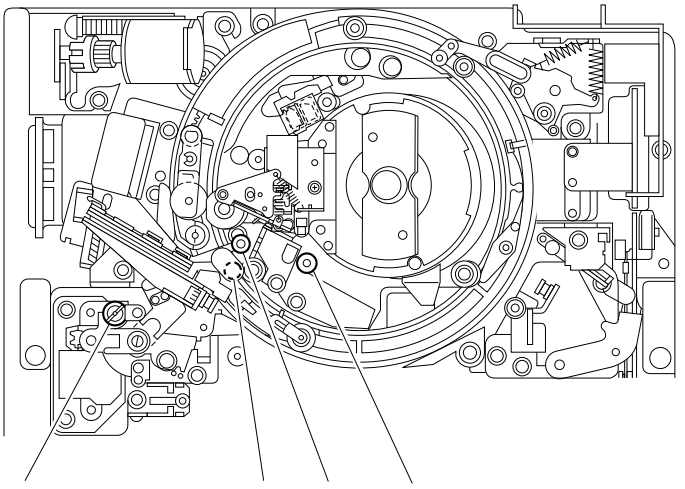
If the height adjustment nut of TG-1 is turned excessively, the head-to-tape contact of the entrance side of the analog output video is growing worse.

(6) Turn the height adjustment nut of TG-2 to clockwise so that the upper flange contacts the tape.

– Continued on the next page. –

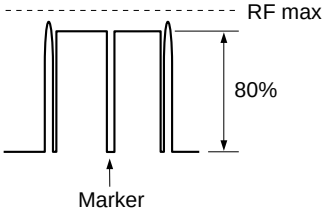
<SS-83 board, side A>





・ Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up

<Fig. 1>



(7) Check that the levels A and B as shown in the figure satisfy the specification 10.

If the waveform is not satisfied the specification 10, perform the adjustment from step (1) again.

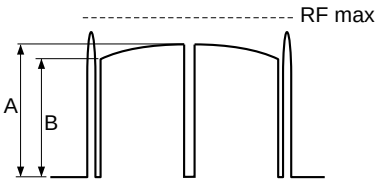
(8) Check the tape running at the tape entrance side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 11 at either TG-0, TG-1 or TG-2, perform the adjustments from the first step (1) again.

12. Recheck the Video Tracking

Perform steps 5 through 10 again.

<Fig. 2>



A = RF max × 0.8

Spec.10 : $\frac{B}{A} \times 100 \geqq 70\%$

<Tape running check at entrance side>

Spec.11 : ① TG-0
The tape runs without any curl at the upper and lower flanges.

② TG-1(S Tention regulator)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

③ TG-2(Entrance guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

④ Lead of drum entrance side
The tape runs in contact with the drum lead and without any curl rt the lead.

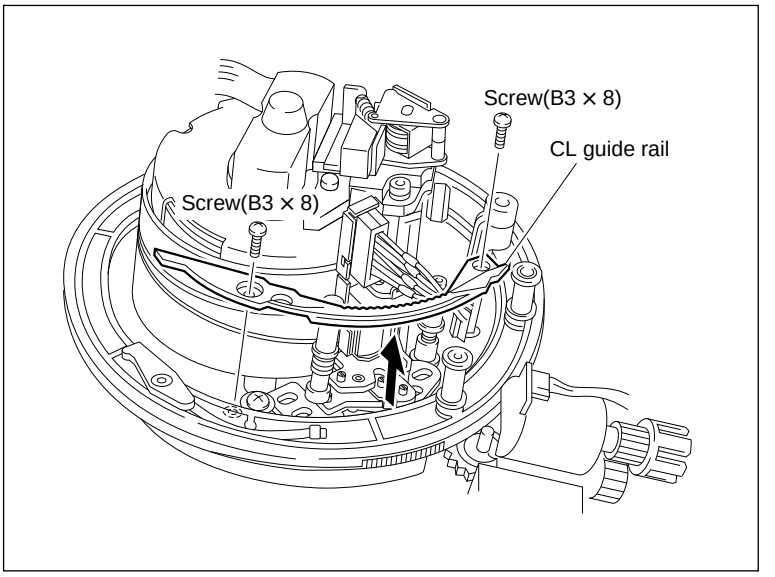
Tracking Adjustment at Tape Entrance Side

http://getMANUAL.com

Tape Exit Side

13. CL Guide Rail Removal

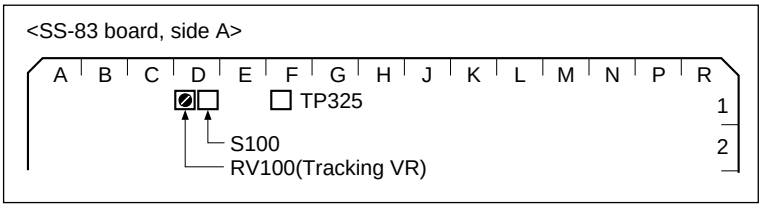
Remove the two screws, then remove the CL guide rail.



CL Guide Rail Removal

14. Tracking Adjust at Tape Exit Side

(1) Play back the SR2-1/P (00:00 to 15:00).
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 on the SS-83 board clockwise and adjust the center portion of the RF envelope waveform to 80% of the maximum output level.



– Continued on the next page. –

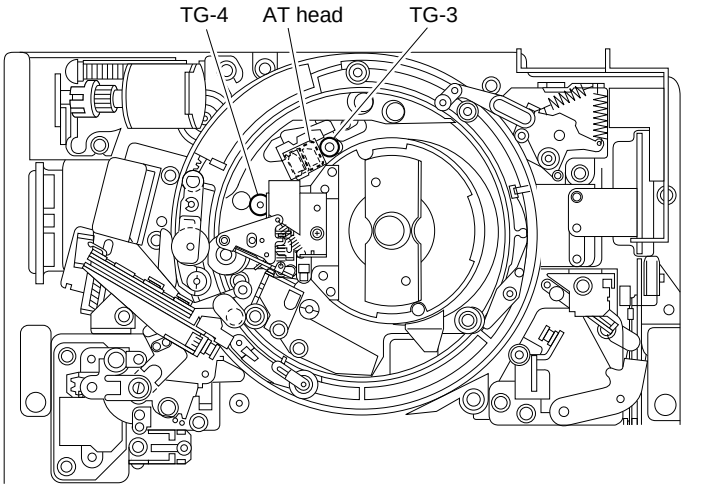
(4) Turn the height adjustment nut of TG-3 counterclockwise by one to two turns so that the tape does not in contact with the upper flange of TG-3.
(5) Turn the height adjustment nut of TG-4 clockwise so that the tape does not in contact with the lower flange of TG-4.
(6) Turn the zenith adjustment screw of the AT head so that the right portion of the RF envelope waveform makes 50% to 100% of the maximum output level. (Fig. 1)
At this time, check that the tape does not in contact with both upper flange of TG-3 and lower flange of TG-4.
If the tape contacts either flange, repeat step (4) or (5).
If the tape moves upward or downward following the guide flange movement, perform the following adjustment.
This trouble cause is uneven tape tension at upside or downside of the tape caused by AT head zenith.
- If the tape moves upward at TG-3:
  Turn the zenith adjustment screw counterclockwise.
- If the tape moves downward at TG-4:
  Turn the zenith adjustment screw clockwise.

(7) Turn the height adjustment nut of TG-3 so that the tape is in contacts with the upper flange and the RF envelope waveform becomes flat. (Fig. 2)
At this time, the tape does not in contact with the lower flange of TG-4.

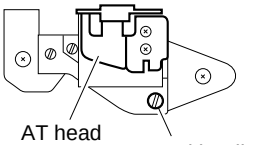
If the waveform does not become flat, perform the check and adjustment below.

① Clean the drum lead with a bamboo stick. (Refer to Section 5-2-4 of the maintenance manual part 1.)
② Press down the tape by bamboo stick very lightly and check that the tape is running without aparting from the drum lead.
③ If the waveform does not become flat even though steps ① and ② mentioned above are performed, adjust the height of TG-3 so that the RF envelope waveform is nearly flat within the range of the specification 12 shown in the Fig.3. At this time, do not overpress the tape at TG-3.

– Continued on the next page. –

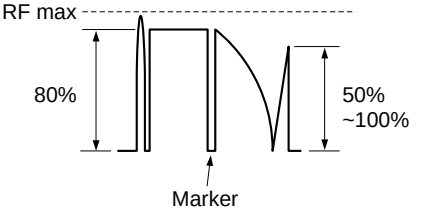


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)

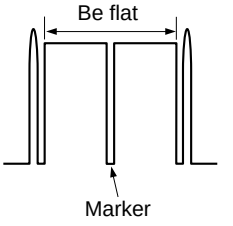


- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
  (Tracking VR : Effective) : D112/SS-83 board lights up

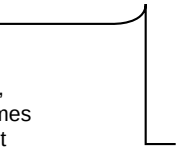
<Fig. 1>



<Fig. 2>



If the pressure against the tape at TG-3 is too much, the waveform becomes as shown in the right figure. (NG)



Note

When adjusting the height of TG-3 in step ③, be sure to check the height of AT head (Refer to Section 4-1-6). If the AT head height does not satisfy the specification, repeat the video tracking adjustment.

(8) Adjust the height of TG-4 so that the lower flange of TG-4 in contact with the tape.
(9) Check the tape running at the tape exit side in the following modes.
- PLAY mode
- F. FWD mode
- REW mode
- REV × 1 mode
- VAR × −1/30 mode

If the tape curl does not satisfy the specification 13 at TG-3, perform the following adjustments while observing the waveform.

① Change the zenith of the AT head within the range of the specification shown in Fig. 1.
② Perform the tracking adjustment again. (Refer to steps (1) through (9) mentioned above.)
③ (In case of the adjustment is performed the AT head zenith)
Perform the checks and adjustments described below.
- AT head height (Refer to Section 4-1-6.)
- AT head azimuth (Refer to Section 4-1-7.)
- AT head head-to-tape contact (Refer to Section 4-1-8.)
- AT head position (Refer to Section 4-1-9.)

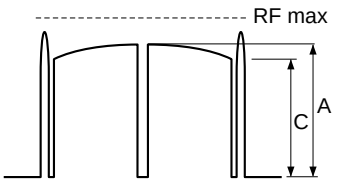
15. Recheck the Video Tracking

Perform the steps 5 through 10 again.

16. Install the CL Guide Rail

Install the CL guide rail with two screws.

<Fig. 3>



A = RF max × 0.8

Spec.12 : $\frac{C}{A} \times 100 \geqq 70\%$

<Tape running check>

Spec.13 : ⑤ Lead of drum exit side
The tape runs without any curl at the lead.

⑥ TG-3 (Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5 (Threading roller)
The tape runs without any curl at the upper and lower flanges.

Tracking Adjustment at Tape Exit Side

4-1-4. CTL Head Height Check and Adjustment

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

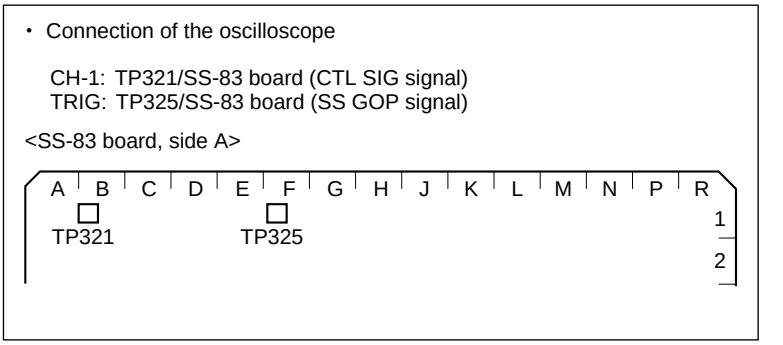
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP321/SS-83 board (CTL signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the SR2-1/P (15:00 to 27:00).

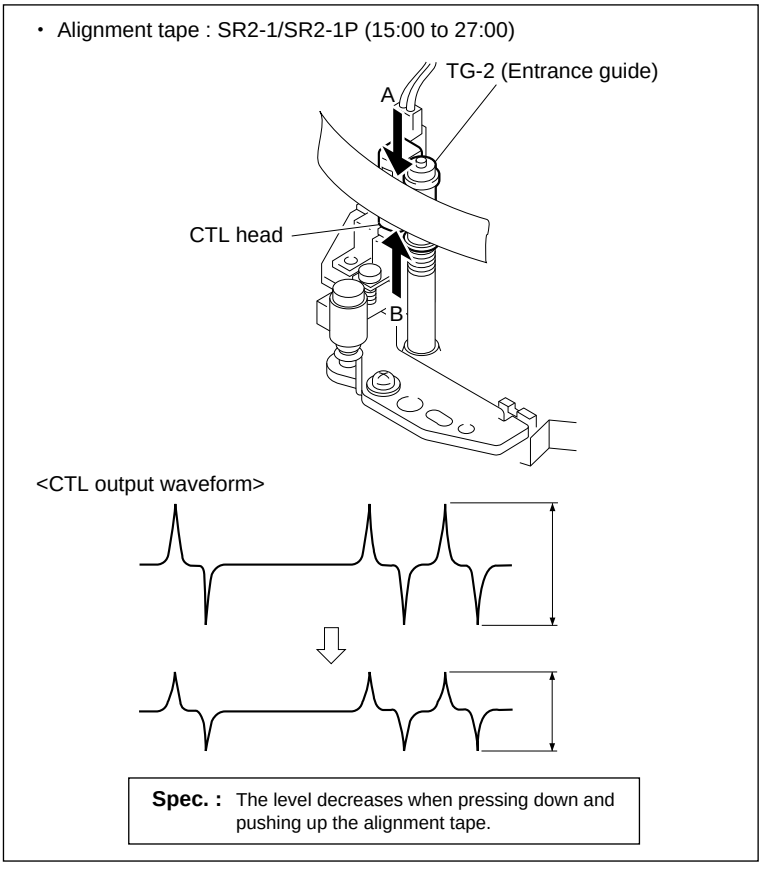
6. Check the CTL Head Height

(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 7.

(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 8.



CTL Head Height Check

Adjustment

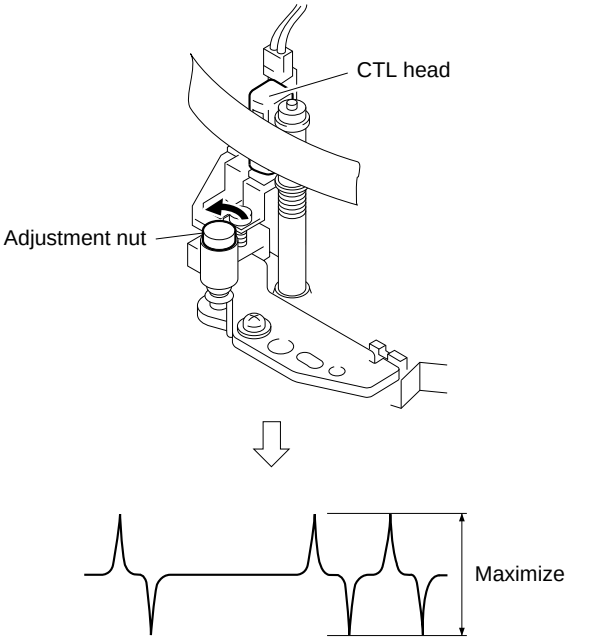
7. In Case the Level Increases when the Tape is Pressed Down (Fig. 1)

Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.

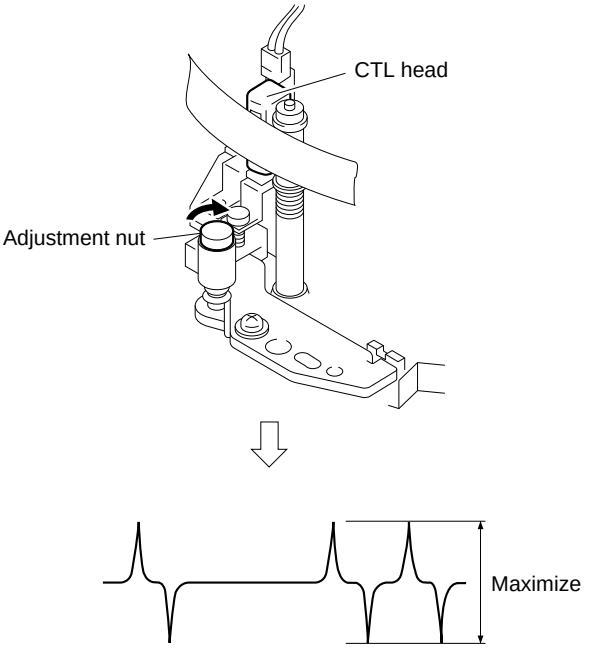
8. In Case the Level Increases when the Tape is Pushed Up (Fig. 2)

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.

<Fig. 1>



<Fig. 2>



CTL Head Height Adjustment

4-1-5. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to confirm the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

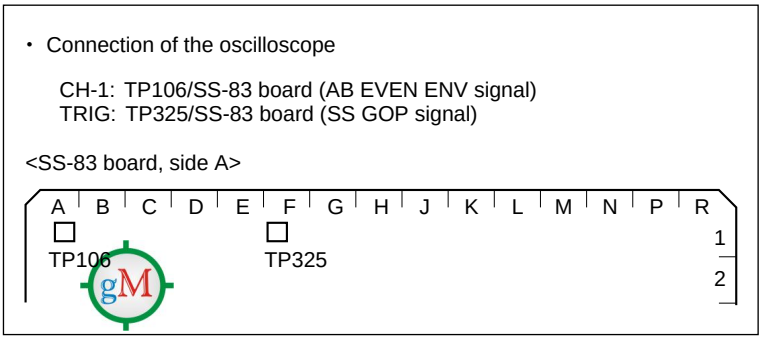
1. Turn the Power Off

2. Connect the Oscilloscope

CH-1: TP106/SS-83 board (AB EVEN ENV signal)
TRIG: TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Mode Setting (PB Head Play Back)

(1) Press S1101 switch on the SS-83 board to enter the maintenance mode.
(2) Set the cursor "∗" to the "M0 : TAPE MAINTENANCE" and press the SET button.
(3) Set the cursor to the "A4 : MECHANISM ADJUST" and press the SET button.
(4) Set the cursor to the "A40 : PATH MODE SEL" and press the SET button.
(5) Check that the "Switching PB" is indicated, and press the SET button.

Note

Refer to the section 4 of the maintenance manual part 1 "Maintenance Mode" for more information about the maintenance mode.

6. Play Back the Alignment Tape

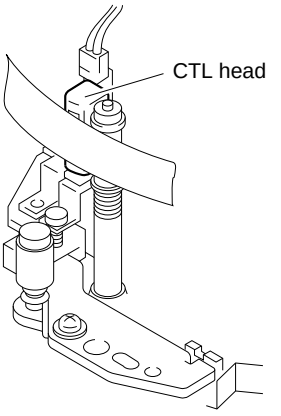
Play back the SR2-1/P (00:00 to 15:00).

7. Check the CTL Head Position

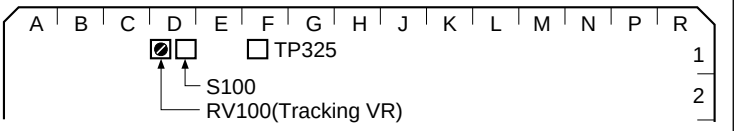
(1) Check that the marker exists in the RF waveform that comes A later than the falling edge of the SS GOP signal. (Spec. 1)
(2) Push S100 switch on the SS-83 board more than 1 sec. so that the tracking VR becomes to be effective.
LED: Check that D112 lights up.
(3) Turn RV100 (tracking VR) on the SS-83 board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.
(4) Push S100 switch on the SS-83 board more than 1 sec. to fix the tracking VR.
LED: Check that D112 lights out.
(5) Read the output level at the center portion of the RF envelope waveform as L_F.
(6) Check that the levels Lv and L_F satisfy the specification 2.

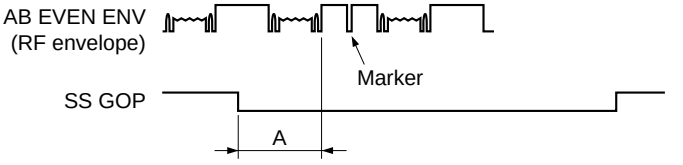
If the specification is not satisfied, perform steps 8 and later.

• Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)
(Tracking VR : Effective) : D112/SS-83 board lights up



<SS-83 board, side A>





Spec.1 : The marker exists in the RF waveform that comes A later than the falling edge of the SS GOP signal.
A = 10 ms (NTSC)
A = 17 ms (PAL)

(Tracking control : Effective state) (Tracking control : Non effective state)

$$\frac{L_F}{L_V} \geqq 0.8$$

Spec.2 : When the tracking VR is not effective, the output level at the center portion of the RF envelope waveform (L_F) is 80% and more against the maximum output level (Lv) under the state of the tracking is effective.

CTL Head Position Check

Adjustment

Note

Perform the adjustment described below under the state of the tracking is not effective.

8. Loosen the Screw

Loosen the securing screw of the CTL head assembly by 1/4 to 1/2 turn.

9. Adjust the CTL Head Position

(1) Insert a 3 mm flatbladed screwdriver into the notch of the CTL head assembly.
(2) Adjust the CTL head assembly position so that the output level at the center portion is maximum and the marker exists in the RF envelope waveform that comes A later than the falling edge of the SS GOP signal.

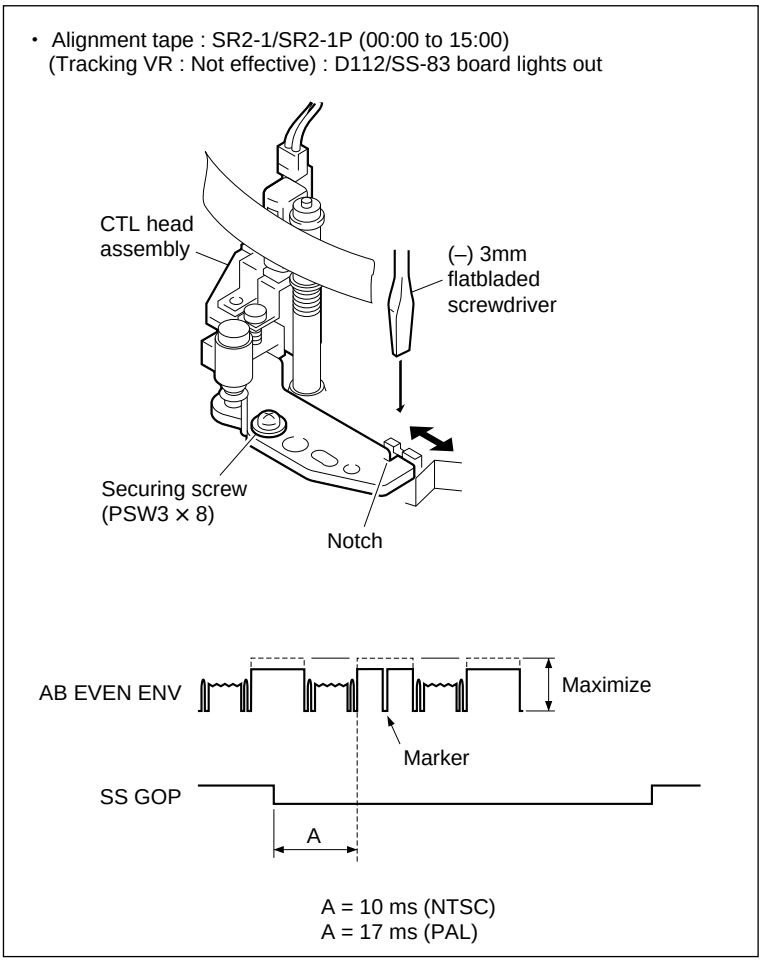
10. Tighten the Screw

Tighten the screw loosened in step 8.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

11. Recheck the CTL Head Position

Perform to steps 5 through 7 again.



CTL Head Position Adjustment

In Case the Adjustment is Performed

12. Adjust the AT Head Position

Refer to Section 4-1-9.

13. Locking Compound Applying

Refer to Section 4-1.

4-1-6. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the azimuth adjustment, head-to-tape contact adjustment, and head position adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

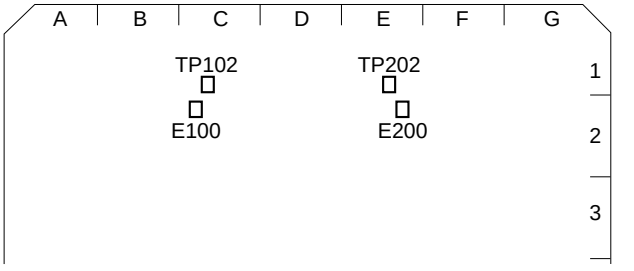
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the AT Head Height

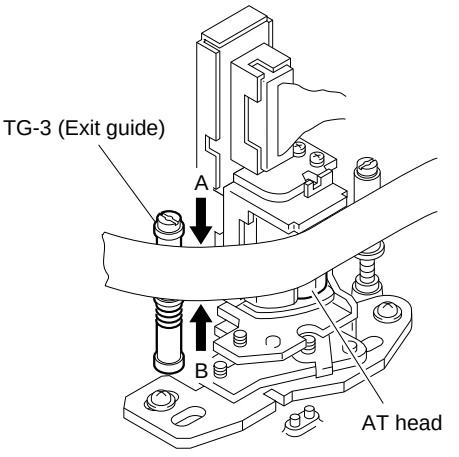
(1) Check that both levels in CH-1 and CH-2 decrease when portion A of the tape shown in the figure is pressed down.

If both levels increase, perform step 7.

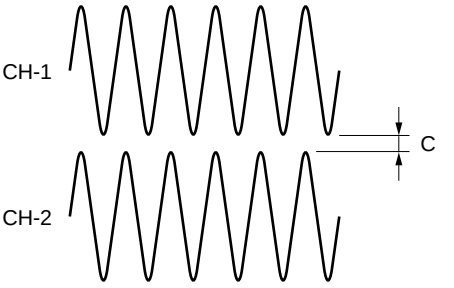
(2) Check that both levels in CH-1 and CH-2 decrease when portion B of the tape is pushed up.

If both levels increase, perform step 8.

・ Alignment tape : CR8-1A/CR8-1A PS (8:00 to 10:00)



<Audio output waveform>



Spec. : The portion C widens when pressing down aud pushing up the alignment yape.

AT Head Height Check

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Adjustment

7. In Case both Levels Increase when the Tape is Pressed Down (Fig. 1)

Turn the height adjustment screw clockwise so that both output waveforms in CH-1 and CH-2 are maximum.

8. In Case both Levels Increase when the Tape is Pushed Up (Fig. 2)

(1) Turn the height adjustment screw counter-clockwise so that both output waveforms in CH-1 and CH-2 are maximum. Turn the height adjustment screw counterclockwise more about 1/2 turn.

(2) Turn the height adjustment screw clockwise and adjust so that both output waveforms in CH-1 and CH-2 maximum.

Note

To stabilize the AT head height after the adjustment, set the maximum output level with the AT head moved from bottom to top (with the height adjustment screw turned clockwise).

In Case the Adjustment is Performed

9. Adjust the AT Head Azimuth

Refer to Section 4-1-7.

10. Adjust the AT Head Head-to-tape Contact

Refer to Section 4-1-8.

11. Adjust the AT Head Position

Refer to Section 4-1-9.

12. Recheck the AT Head Height

Refer to steps 5 and 6 in this section.

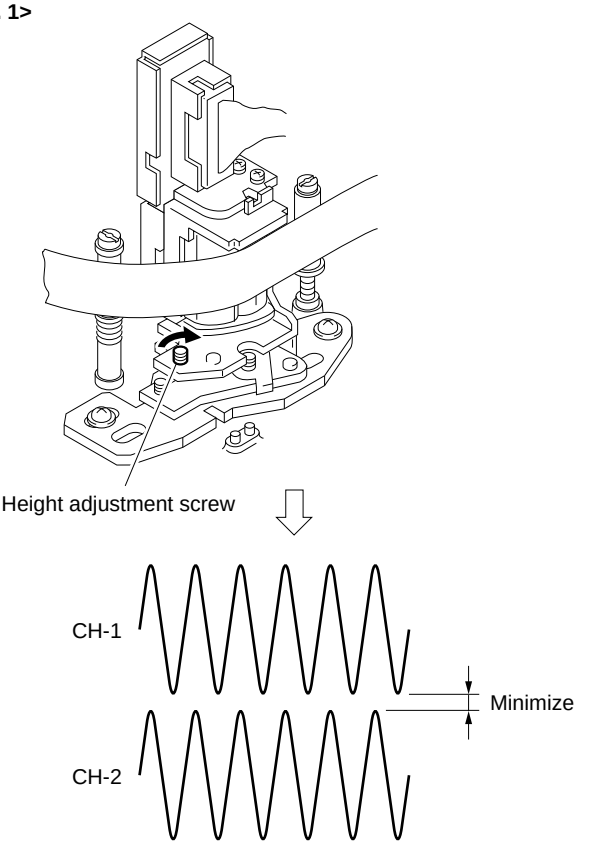
13. Re-check the AT Head

Perform the steps 9, 10 and 11 again.

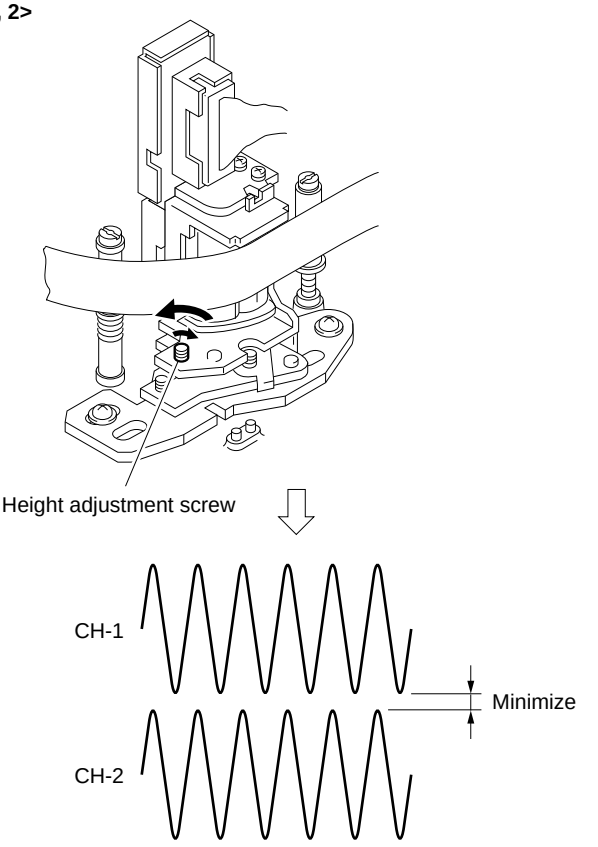
14. Locking Compound Applying

Refer to Section 4-1.

<Fig. 1>



<Fig, 2>



AT Head Height Adjustment

4-1-7. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to the head-to-tape contact adjustment, head position adjustment, and head height adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head azimuth is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
MODE : X-Y

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

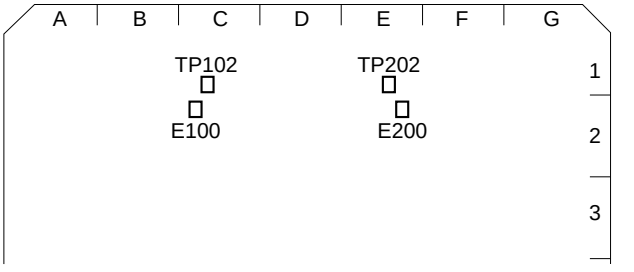
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

Check

4. Turn the Power On

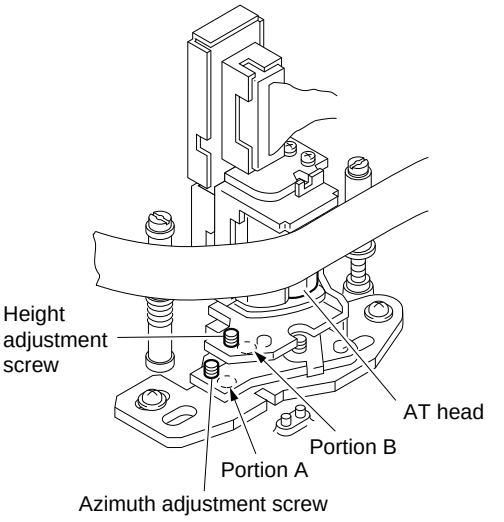
5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

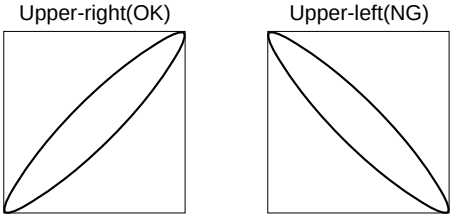
6. Check the AT Head Azimuth

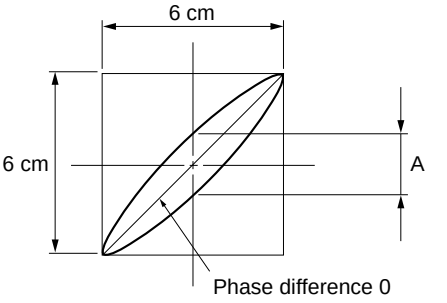
(1) Adjust the horizontal and vertical amplitudes of lissajous waveform to 6 cm each.
(2) Check that the lissajous waveform holds the upper-right shape.
(3) Check that the vertical amplitude at the center point in the horizontal direction satisfies the specification.
(4) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.
(5) If the specification in any of steps (1), (2) or (3) is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS (3:00 to 4:55)



<Lissajous waveform>





Spec. : A ≦ 0.52 cm

AT Head Azimuth Check

Adjustment

7. Adjust the AT Head Azimuth

(1) Turn the azimuth adjustment screw so that the specification is satisfied.

(2) Strike the portions A and B shown in the figure lightly with the tip of a screwdriver. Then check that the specification is satisfied.

In Case the Adjustment is Performed

8. Adjust the AT Head Head-to-tape Contact

Refer to Section 4-1-8.

9. Adjust the AT Head Position

Refer to Section 4-1-9.

10. Check the AT Head Height

Refer to Section 4-1-6.

11. Check the AT Head Azimuth

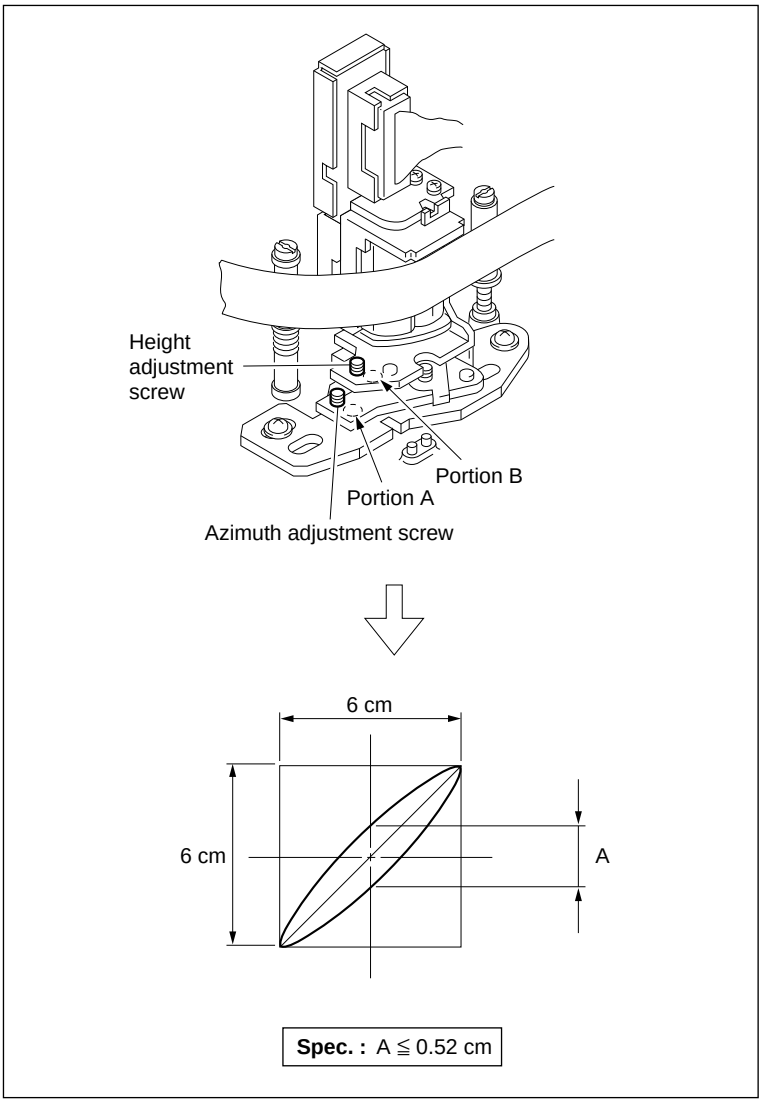
Refer to steps 5 and 6 in this section.

12. Re-check the AT head

Rerform the steps 8, 9 and 10 again.

13. Locking Compound Applying

Refer to Section 4-1.



AT Head Azimuth Adjustment

4-1-8. AT Head Head-to-tape Contact Check and Adjustment

Note

The AT head head-to-tape contact adjustment is closely related to the head position adjustment, head height adjustment, and head azimuth adjustment.
Be sure to perform adjustments (or checks) according to “In case the adjustment is performed” in this section when the AT head head-to-tape contact is adjusted.

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Torque screwdriver (6 kgf•cm) (JB-5251): J-6252-510-A
- Torque screwdriver’s bit (+2 mm, l= 75 mm): J-6323-420-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

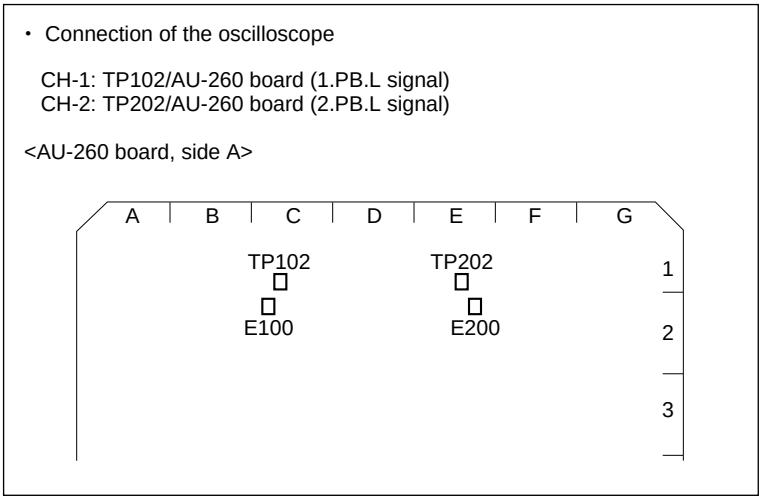
CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2.PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 1 ms/DIV

Note

“1.PB.L” signal (TP102) is the playback signal of the CH-1 of the AT head.
“2.PB.L” signal (TP202) is the playback signal of the CH-2 of the AT head.

3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Preparation

Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 10 kHz, −10 VU signal portion (3:00 to 4:55) on the CR8-1A/PS.

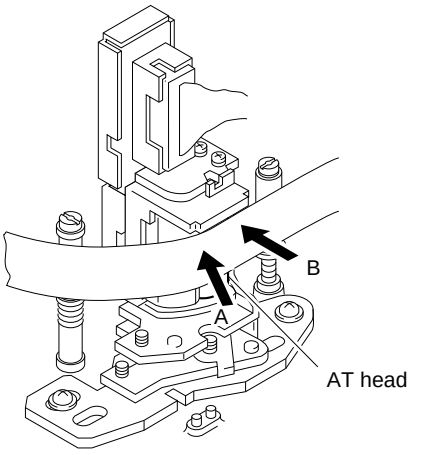
6. Check the AT Head Head-to-tape Contact

(1) Push portions A and B of the tape shown in the figure slightly. (It means increasing the tape's wrapping angle against the AT head.)

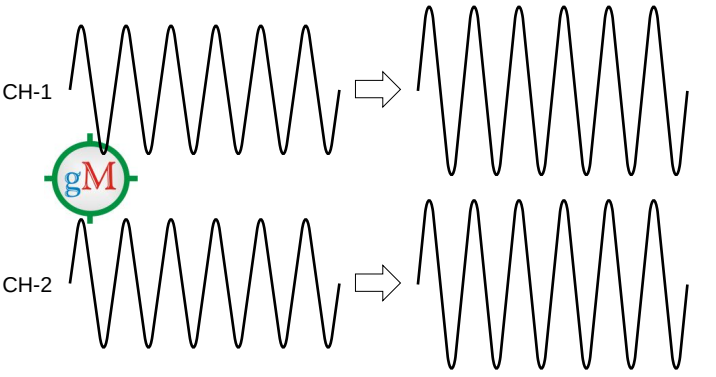
(2) Check that both increasing values of the output levels in CH-1 and CH-2 satisfy the specification.

If the specification is not satisfied, perform steps 7 and later.

• Alignment tape : CR8-1A/CR8-1A PS(3:00 to 4:55)



<AUDIO output waveform>



Spec. : Both increasing values of the output levels in CH-1 and CH-2 are within 5%.

AT Head Head-to-tape Contact Check

Adjustment

7. Loosen the Screws

Loosen the two head securing screws by 1/4 to 1/2 turn.

8. Adjust the AT Head Head-to-tape Contact

(1) Insert a 2 mm flatbladed screwdriver into the notch of the adjustment plate.
(2) Adjust the AT head position so that the output waveform is maximum.

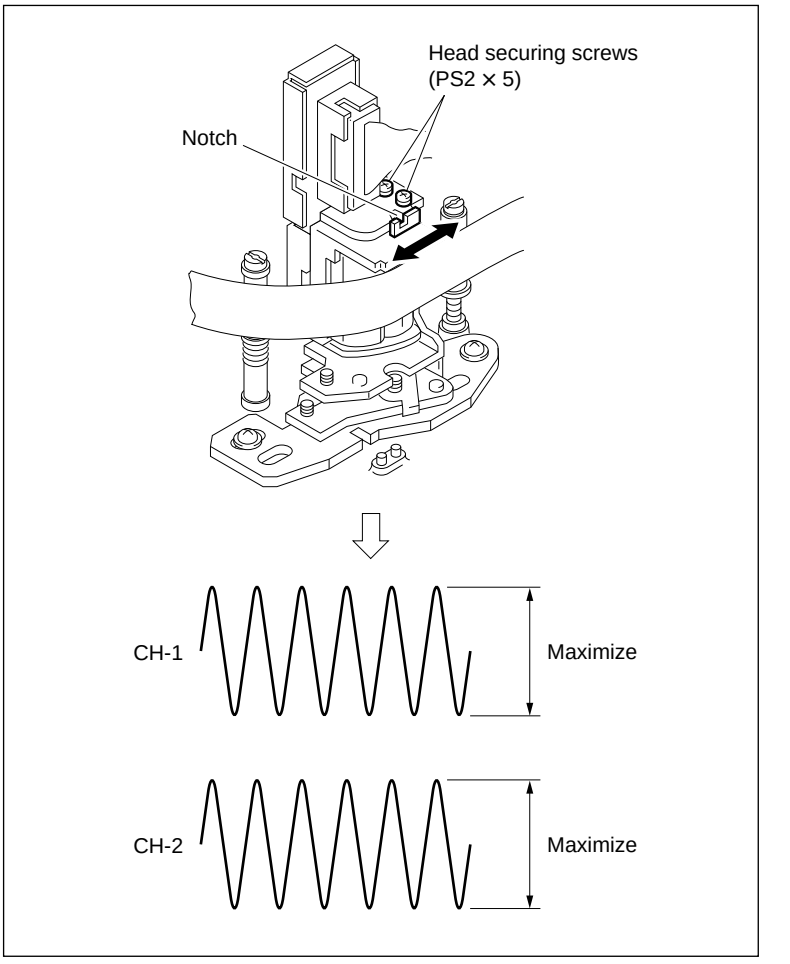
9. Tighten the Screws

Tighten the two securing screws loosened in step 7.

Tightening torque: 19.6×10^{-2} N•m (2 kgf • cm)

10. Recheck the AT Head Head-to-tape Contact

Refer to steps 5 and 6 in this section.



AT Head Head-to-tape Contact Adjustment

In case the adjustment is performed

11. Check the AT Head Position

Refer to Section 4-1-9.

12. Check the AT Head Height

Refer to Section 4-1-6.

13. Check the AT Head Azimuth

Refer to Section 4-1-7.

4-1-9. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as reference.
- The AT head position adjustment is closely related to the head height adjustment, head azimuth adjustment, and head-to-tape contact adjustment.
  Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape SR2-1 (For 525/60 system): 8-960-075-11
- Alignment tape SR2-1P (For 625/50 system): 8-960-075-61
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP304/SS-83 board (CTL PULSE signal)
CH-2 : TP102/TC-102 board (PB LTC signal)
TRIG : TP325/SS-83 board (SS GOP signal)
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms to 500 µs/DIV

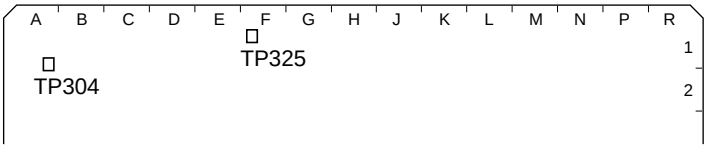
3. Set the Alignment Tape

Set the SR2-1/P and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

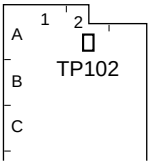
- Connection of the oscilloscope

  CH-1:TP304/SS-83 board (CTL PULSE Signal)
  CH-2:TP102/TC-102 board (PB LTC Signal)
  TRIG:TP325/SS-83 board (SS GOP Signal)

<SS-83 BOARD, Side A>



<TC-102 BOARD, Side A>



Preparation

Check

4. Turn the Power On

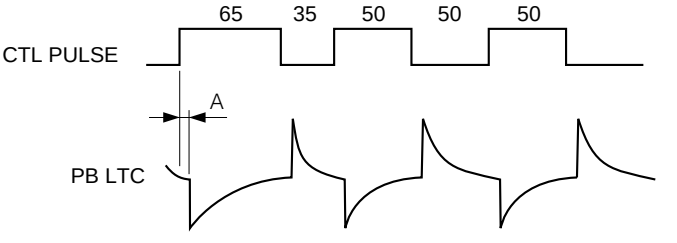
5. Play Back the Alignment Tape

Play back the SR2-1/P (00:00 to 15:00).

6. Check the AT Head Position

Check that the positional relationship between the rising edges of CTL's 65:35 pulse and PB LTC's 65:35 waveform signals satisfies the specification.
If the specification is not satisfied, perform steps 7 and later.

- Alignment tape : SR2-1/SR2-1P (00:00 to 15:00)



Spec. : A = 0 ±600 µs

AT Head Position Check

Adjustment

7. CL Guide Rail Removal
Remove the two screws, then remove the CL guide rail.

8. Loosen the Screws
Loosen the two securing screws of the AT head assembly by 1/4 to 1/2 turn.

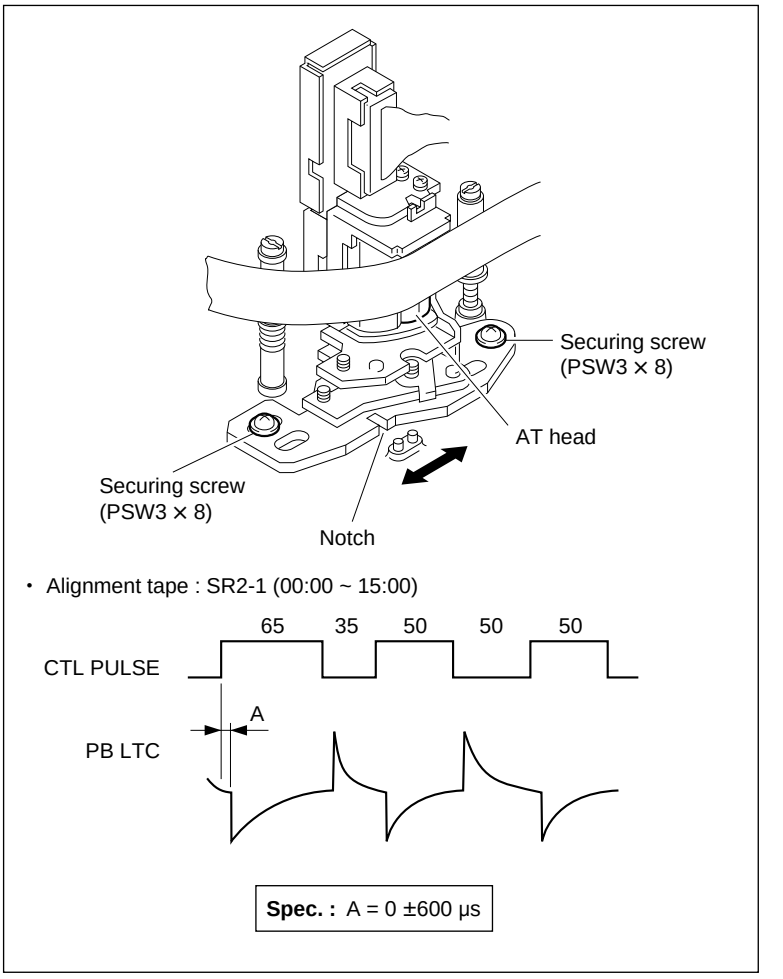
9. Adjust the AT Head Position
(1) Insert a 3 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the Screws
Tighten the two screws loosened in step 8.

Tightening torque: 98×10^{-2} N•m
(10.0 kgf • cm)

11. Recheck the AT Head Position
Refer to steps 5 and 6 in this section.

12. CL Guide Rail Installation
Install the CL guide rail with two screws.



AT Head Position Adjustment

In Case the Adjustment is Performed

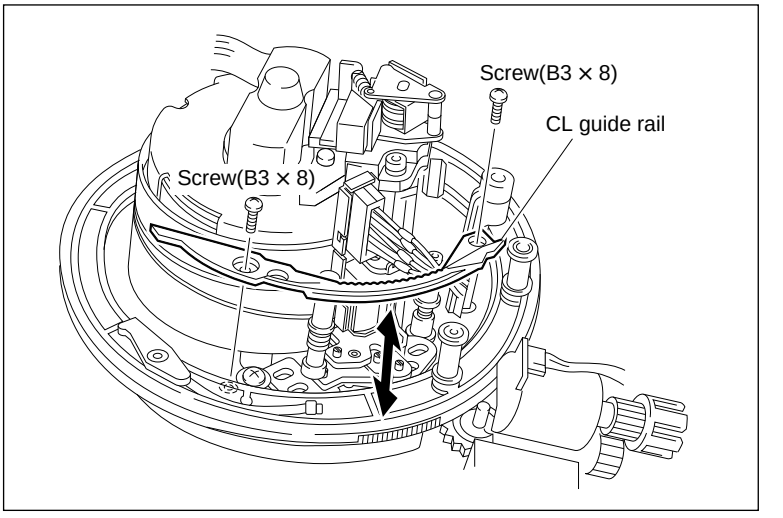
13. Check the AT Head Height
Refer to Section 4-1-6.

14. Check the AT Head Azimuth
Refer to Section 4-1-7.

15. Check the AT Head Head-to-tape Contact
Refer to Section 4-1-8.

16. Check the AT Head Position
Refer to steps 5 and 6 in this section.

17. Locking Compound Applying
Refer to Section 4-1.



CL guide rail Removal/Installation

4-1-10. Audio Level Check and Adjustment in REV Mode

Tools

- Alignment tape CR8-1A (For DNW-A75): 8-960-097-45
- Alignment tape CR8-1A PS (For DNW-A75P): 8-960-098-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Betacam cassette (S cassette): BCT-30MA
- Adjustment mirror (circular): J-6080-029-A
- Tape guide adjustment driver (MW-261): J-6322-610-A

Preparation

1. Turn the Power Off

2. Connect the Oscilloscope

CH-1 : TP102/AU-260 board (1.PB.L signal)
Ground at E100
CH-2 : TP202/AU-260 board (2. PB.L signal)
Ground at E200
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms/DIV

Note

"1.PB.L" signal (TP102) is the playback signal of the CH-1 of the AT head.
"2.PB.L" signal (TP202) is the playback signal of the CH-2 of the AT head.

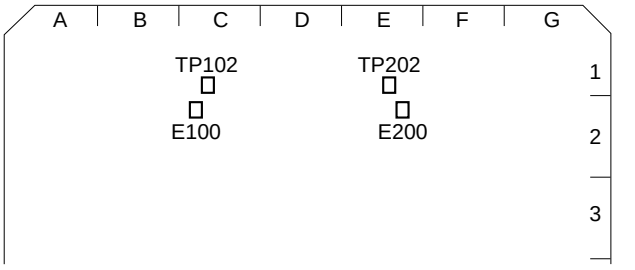
3. Set the Alignment Tape

Set the CR8-1A/PS and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope

CH-1: TP102/AU-260 board (1.PB.L signal)
CH-2: TP202/AU-260 board (2.PB.L signal)

<AU-260 board, side A>



Preparation

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Check

4. Turn the Power On

5. Play Back the Alignment Tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A/PS.

6. Check the Audio Output Level

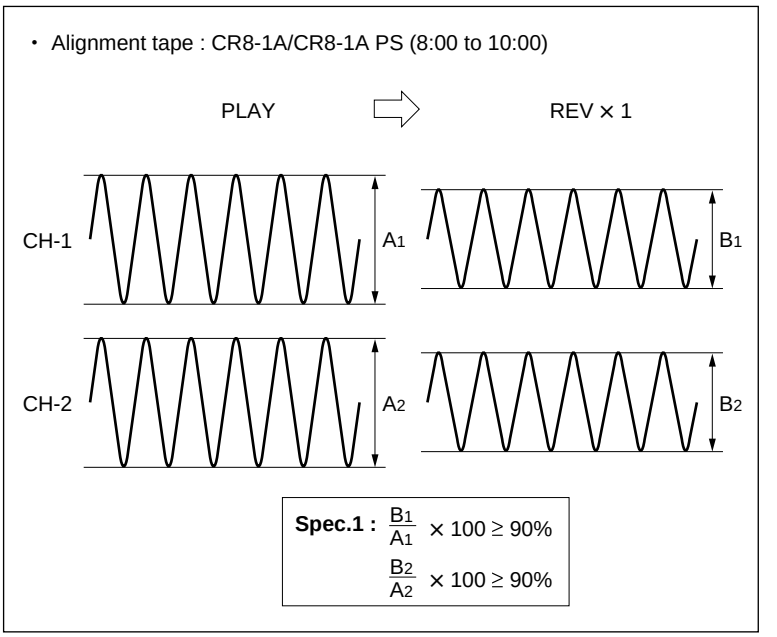
(1) Check the audio output level A_1 in CH-1.
(2) Check the audio output level A_2 in CH-2.

7. Put the Unit into the REV × 1 Mode

8. Check the Audio Output Level

(1) Check that the audio output level B_1 in CH-1 satisfies specification 1.
(2) Check that the audio output level B_2 in CH-2 satisfies specification 1.

If specification 1 is not satisfied, perform steps 9 and later.



Audio Level Check in REV Mode

Adjustment

9. Adjust the TG-5 (Threading Roller) Height

(1) Play back the 1 kHz, 0VU signal portion (8:00 to 10:00) on the CR8-1A/PS.
(2) Put the unit into the REV × 1 mode.
(3) In case the level increases when portion A of the tape shown in the figure is pressed down, turn the upper flange of TG-5 clockwise using a tape guide adjustment driver.
In case the level increases when portion B is pushed up, turn the upper flange of TG-5 counterclockwise.

Note

First, press the EJECT button to unthread the tape when turning the upper flange of TG-5.

(4) Check the audio output level satisfies specification 1. (Refer to steps 5 through 8.)

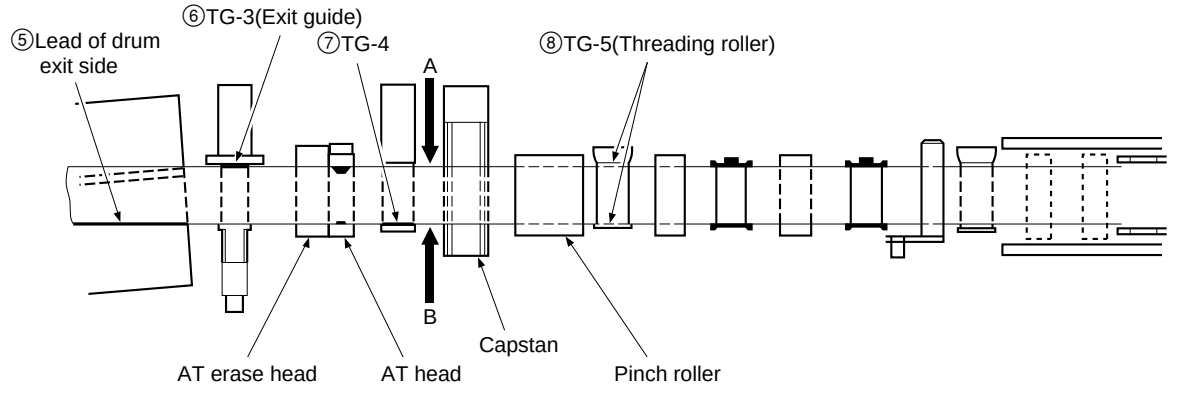
If the specification 1 is not satisfied, repeat steps (1) through (3) mentioned above.

10. Check the Tape Running at Tape Exit Side

In the modes below, check that the tape running condition satisfies specification 2.
(1) PLAY mode
(2) REV × 1 mode

If specification 2 is not satisfied, adjust the tape guides height at the tape exit side. (Refer to steps 12 through 14 (at the Tape Exit Side) in Section 4-1-2.)

If the height of the tape guide is adjusted, perform the video tracking check.
(Refer to Section 4-1-3.)



Spec.2 : ⑤ Lead of drum exit side
The tape runs in contact with the drum lead and without any curl at the lead.

⑥ TG-3(Exit guide)
The tape runs in contact with the upper flange.
The tape curl is less than 1/10 of the tape width.

⑦ TG-4
The tape runs in contact with the lower flange.
The tape curl is less than 1/10 of the tape width.

⑧ TG-5(Threading roller)
The tape runs without any curl at the upper and lower flanges.

Audio Level Adjustment in REV Mode

Section 5
Electrical Alignment after Main Parts Replacement

5-1. Electrical Alignment Overview

5-1-1. Notes on Electrical Alignment

- Be sure to perform the adjustment in order.
- Never touch (or turn) the adjustment part carelessly.
- Do not execute automatic adjustment carelessly, and do not change adjustment data carelessly.
  If executed or changed carelessly, turn off the power of the VTR or execute “ALL DATA PREVIOUS” in each NV-RAM control menu so as not to save the data.

  Note

  NV-RAM control menu for the servo and DT systems have no function “ALL DATA PREVIOUS”.
  If executed carelessly the automatic adjustment, turn off the power of the VTR.
- For details on the maintenance mode, refer to Section 4 of the maintenance manual Part 1.
- Before beginning adjustment, it is recommended to make a copy of check sheets given in the maintenance manual Part 1 “Appendix A” and write down setup conditions such as switches’ setting in the check sheets.
  If setup conditions are noted, the settings can be returned easily to its original condition after finishing adjustment.

5-1-2. Outline of Electrical Alignment

In Section 5 explains the electrical alignment after replacing the following parts.

- Drum assembly / Upper drum assembly ..... Section 5-2
- AT head ..... Section 5-3

5-2. Electrical Adjustment after Replacing the Drum

5-2-1. Adjustment Overview

Perform this section when the drum assembly or upper drum assembly was replaced.

For adjustment items and its order, refer to “Adjustment Items” (next page).

Note

During adjusting, besure to reattach the upper lid unless the PC board is extended.

Tools List

To perform the adjustment after replacing the drum, prepare the following equipment and fixtures.

- Analog composite video signal generator
  For DNW-A65: TEKTRONIX TSG-170A or equivalent
  For DNW-A65P: TEKTRONIX TSG-271 or equivalent
- Analog component waveform monitor:
  TEKTRONIX WFM300 or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer:
  ADVANTEST R3261A or equivalent
- Analog component video monitor
  (NTSC/PAL switchable type)

  Note

  Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension harness: 14P (Part No. 1-952-684-11)
- Extension board: EX-377 (Part No. J-6269-810-A)
  EX-556 (Part No. J-6277-212-A)
- Recording tape: BCT-SX series (Betacam SX cassette) (Sony’s standard products)

  Note

  For this recording tape, prepare the virgin tape or no recorded tape that erased using the tape eraser, etc. in advance.
- Cleaning tape: BCT-5CLN
  (Sony’s standard products)
- Alignment tapes
  For DNW-A65: SR2-1 (Part No. 8-960-075-11),
  SR5-1 (Part No. 8-960-075-01),
  CR2-1B (Part No. 8-960-096-01),
  CR2-1 PS (Part No. 8-960-096-51),
  CR5-1B (Part No. 8-960-096-41),
  and CR5-2A (Part No. 8-960-097-44)
  For DNW-A65P: SR2-1P (Part No. 8-960-075-61),
  SR5-1P (Part No. 8-960-075-51),
  CR2-1B (Part No. 8-960-096-01),
  CR2-1B PS (Part No. 8-960-096-51),
  CR5-1B PS (Part No. 8-960-096-91),
  and CR5-2A PS (Part No. 8-960-098-44)
- 75 Ω terminators (5 pieces)
- Shorting clips (2 pieces)

Adjustment Items

No.	Item		Adjustment point	Remarks
5-2-3	Drum phase adjustment		A11 : RF SWITCHING POS.	(Automatic adjustment)
		Data save	A12 : NV-RAM CONTROL	
5-2-4	DT system adjustment (Standard video system) (Analog Betacam)			
		Offset level	A030 : HEAD OFFSET LEVEL	(Automatic adjustment)
		Drive gain	A031 : DRIVE GAIN	(Automatic adjustment)
		Data save	A032 : NV-RAM CONTROL	
5-2-5	EQ equalizer adjustment (Betacam SX)		A11 : EQUALIZER	(Automatic adjustment)
		Data save	A1F : NV-RAM CONTROL	
5-2-6	EQ RF output level adjustment (Analog Betacam)			
		METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
		METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
		OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
		OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
			Data save	A3F : NV-RAM CONTROL
5-2-7	DM RF output level adjustment (Analog Betacam)			
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE C	⊘RV407/DM-89	TP7/DM-89
		OXIDE Y	⊘RV212/DM-89	TP3/DM-89
5-2-8	OMC carrier balance adjustment (Analog Betacam)			
		METAL Y	⊘RV107/DM-89, ⊘RV108/DM-89	TP105/DM-89
		METAL C	⊘RV307/DM-89, ⊘RV308/DM-89	TP305/DM-89
		OXIDE C	⊘RV305/DM-89, ⊘RV306/DM-89	TP305/DM-89
		OXIDE Y	⊘RV105/DM-89, ⊘RV106/DM-89	TP105/DM-89
5-2-9	OMC carrier balance provisional adjustment (Analog Betacam)	**Note** This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (Section 5-2-8) using the spectrum analyzer. Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. Be sure to perform the adjustment (Section 5-2-8) using the spectrum analyzer at a later date.		
5-2-10	Demodulator limiter balance adjustment (Analog Betacam)			
		Y	⊘RV502/DM-89	TP501/DM-89
		C	⊘RV702/DM-89	TP8/DM-89

(continue)

(Continued)

No.	Item		Adjustment point	Remarks
5-2-11	PB frequency response adjustment (Analog Betacam)	METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPONENT Y
		METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	VIDEO OUTPUT COMPONENT R-Y/B-Y
		OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPONENT Y
		Data save	A3F : NV-RAM CONTROL	
5-2-12	DM RF output level readjustment (Analog Betacam)	OXIDE C	⊘RV212/DM-89	TP3/DM-89
		METAL Y	⊘RV211/DM-89	TP3/DM-89
		METAL C	⊘RV406/DM-89	TP7/DM-89
		OXIDE Y	⊘RV407/DM-89	TP7/DM-89
5-2-13	RF envelope adjustment (Analog Betacam)	Y	⊘RV205/DM-89	TP203/DM-89
		C	⊘RV405/DM-89	TP403/DM-89
5-2-14	Impact error offset adjustment (Analog Betacam)	Y	⊘RV401/TBC-24	Video monitor
		C	⊘RV601/TBC-24	Video monitor
5-2-15	TBC Y/C delay adjustment (Analog Betacam)	METAL	⊘RV500/TBC-24 ⊘RV504/TBC-24*1	VIDEO OUTPUT COMPONENT
		OXIDE	⊘RV501/TBC-24	VIDEO OUTPUT COMPONENT
5-2-16	AFM RF level adjustment (Betacam SP)		⊘RV500/AU-260	TP570/AU-260, TP580/AU-260
5-2-17	DT system adjustment (Another video system) (Analog Betacam)	Offset level	A030 : HEAD OFFSET LEVEL	(Automatic adjustment)
		Drive gain	A031 : DRIVE GAIN	(Automatic adjustment)
		Data save	A032 : DATA SAVE	

*1: RV504 is not equipped on the TBC-24 board of board number suffixes 11, 12, and 13.

5-2-2. Common Preparation

Perform the settings (switches, setup extend menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the Betacam / Betacam SP PB system alignment.

1. Reset the all switches on the DM-89 and TBC-23A boards to the factory settings.
   Note
   Before removing the board, turn off the power.

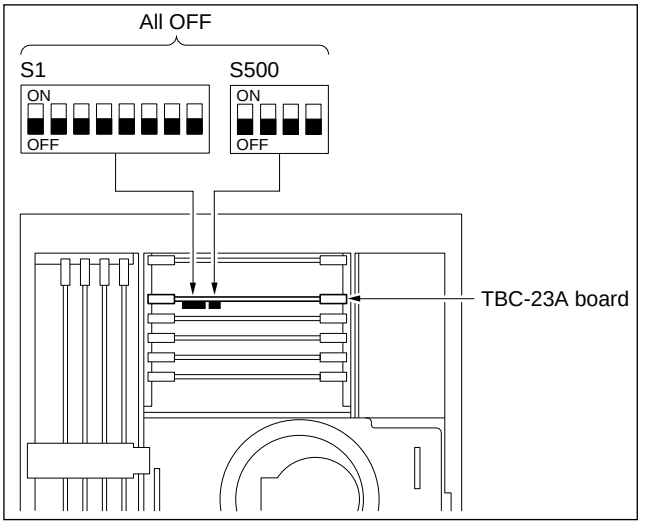
Board	Ref. No.	Factory setting
DM-89	S101, S102, S301, S302	NOR (right side)
	S501	ON (right side)
	S901	all OFF (down side)
TBC-23A	S1, S500	all OFF (down side)

2. Set the VTR's switches as follows:

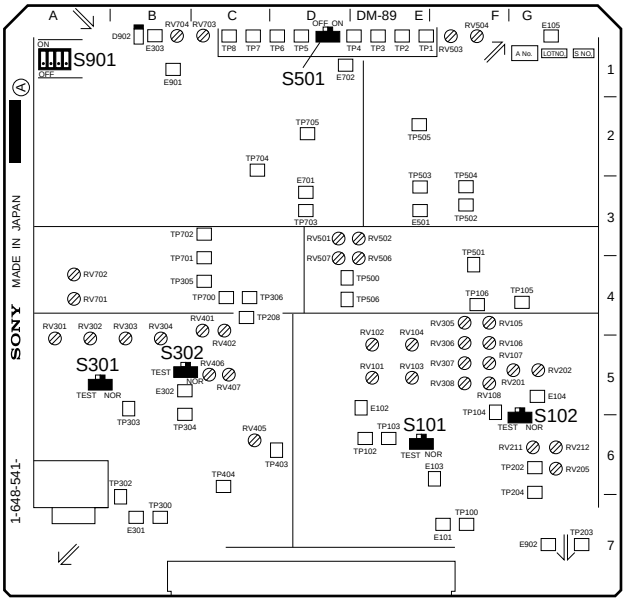
Location Item	Customer setting	Setting at adjustment
SS-83 board DIP switch S1100-1 (M-1)	_____	⇨ ON (up position)
Note Set to treat the extended menu of the setup menu.		
Sub control panel		
CHARACTER switch	_____	⇨ ON
PROCESS CONTROL switch	_____	⇨ LOCAL
• VIDEO switch	_____	⇨ PRESET
• CHROMA switch	_____	⇨ PRESET
• SET UP / BLACK LEVEL switch	_____	⇨ PRESET
• Y/C DELAY switch	_____	⇨ PRESET
• CHROMA PHASE switch	_____	⇨ PRESET
KEY INHIBIT switch	_____	⇨ OFF
CAPSTAN LOCK switch	_____	⇨ 2FD
Upper control panel		
TC (LTC/AUTO/VISC)	_____	⇨ LTC
REMOTE: 9P	_____	⇨ Off (Light off)
50P	_____	⇨ Off (Light off)

3. For DNW-A65, be sure to adjust in the 525/60 system.
   For DNW-A65P, be sure to adjust in the 625/50 system.
   If differed, change the operation system using the setup menu ITEM-013 before adjusting. (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)
4. For the DNW-A65 only: Set the ITEM-709 and -713 in the setup extended menu as follows:

ITEM No. SUB-ITEM	Customer setting	Setting at adjustment
709 : CAV LEVEL FORMAT		
1. OUTPUT CAV LEVEL	_____	⇨ B-CAM
713 : VIDEO SETUP REFERENCE LEVEL		
0. MASTER LEVEL	_____	⇨ 0.0%
3. BETACAM PB LEVEL	_____	⇨ MSTER
4. OUTPUT LEVEL	_____	⇨ MSTER



S1 and S500 on TBC-23A Board



DM-89 Board (Side A)

5-2-3. Drum Phase Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A65: SR2-1 (for 525/60 system)
DNW-A65P: SR2-1P (for 625/50 system)

1. Insert the alignment tape SR2-1 or SR2-1P, then advances it to the time code 00:25:00:00.
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A011 : RF SWITCHING POS.
   - The alignment tape is ejected on the way to menu A011.
4. Select “AUTO”.
5. Insert this alignment tape again, then the adjustment is executed automatically.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
6. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

7. Enter A012 : NV-RAM CONTROL, then execute “SAVE SERVO ADJUST DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

8. To exit the maintenance mode, press the MENU button five times.
9. Eject the alignment tape.

5-2-4. DT System Adjustment (Standard Video System) (Analog Betacam)

Prepare the following alignment tape to perform this adjustment.
DNW-A65: CR5-1B or CR5-2A
(for NTSC analog Betacam)
DNW-A65P: CR5-1B PS or CR5-2A PS
(for PAL analog Betacam)

Offset level adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
4. Insert the alignment tape again.
5. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
6. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
7. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

8. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
9. To exit the maintenance mode, press the MENU button five times.
   - The alignment tape is ejected automatically.

Drive gain adjustment

1. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A031 : DRIVE GAIN.
   • The alignment tape is ejected on the way to menu A031.
4. Insert the alignment tape again.
5. Press the SET button.
   • Message “Set VARIABLE × 3” is displayed on the video monitor.
6. Press the VAR button.
   • The VAR button is lit, and the search dial is entered the VARIABLE mode.
7. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
   • The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
   • Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. Press the JOG button.
   • The JOG button is lit, and the search dial is entered the JOG mode.
9. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

10. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
    • Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.

11. To exit the maintenance mode, press the MENU button five times.
    • The alignment tape is ejected automatically.

5-2-5. EQ Equalizer Adjustment (Betacam SX)

Prepare the following alignment tape to perform this adjustment.
DNW-A65: SR5-1 (for 525/60 system)
DNW-A65P: SR5-1P (for 625/50 system)

1. Insert the alignment tape SR5-1 or SR5-1P, then search it in time code 00:03:00:00.
2. To enter the maintenance mode, press S1101 (L-1) of the SS-83 board.
3. Enter A11 : EQUALIZER.
   • Message “Auto Adjust (Push SET)” is displayed on the video monitor.
4. Check that there is the ∗ mark to “ALL” on the video monitor.
   If not, set the ∗ mark to “ALL” with the search dial turned.
5. To execute the automatic adjustment, press the SET button once.
   • Message “Auto Adjust Complete” is displayed on the video monitor when this adjustment is completed normally.
6. To exit the maintenance mode, press the MENU button four times.
7. Eject the alignment tape.

Data save (Store the adjusted data)

8. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
9. Enter A1F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
   • Message “Save Complete” is displayed on the video monitor when this data save is completed normally.

10. To exit the maintenance mode, press the MENU button four times.

5-2-6. EQ RF Output Level Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

DNW-A65: CR5-1B and CR5-2A
(for NTSC analog Betacam)

DNW-A65P: CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment: Oscilloscope

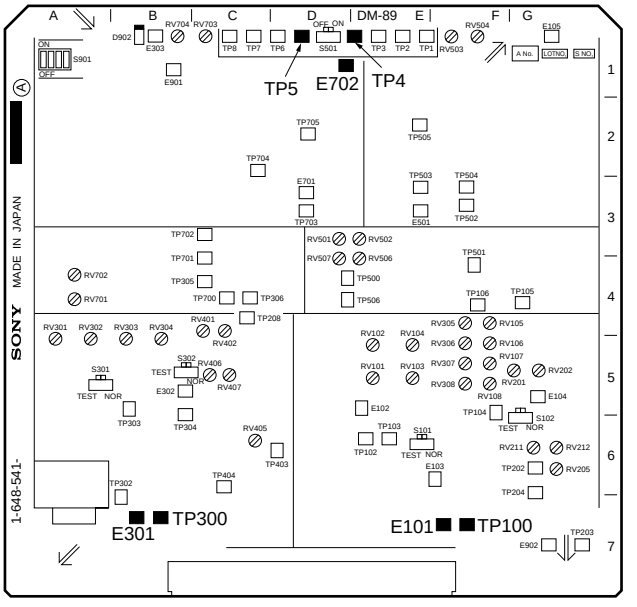
1. Turn off the power.
2. Extend the DM-89 board with an extension board EX-377.
3. Turn on the power.
4. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
5. Enter A30 : EQ VR in A3 : BETACAM PB ADJUST.

Note

How to change the data

(1) Set the ∗ mark on the video monitor to the line to be changed the data by turning the search dial.
(In the time data display area of the VTR, display the item by turning it, “RF G M-Y-A” for example.)

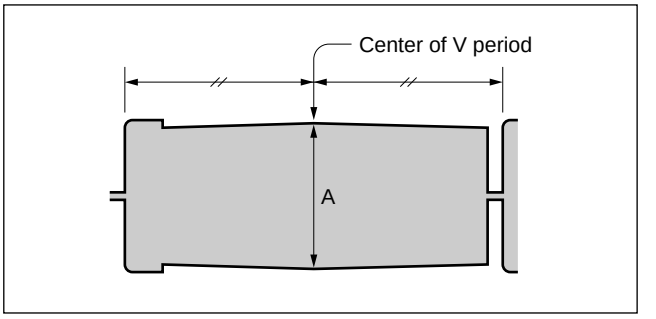
(2) To change the data, turn the search dial with the JOG button pressing.



DM-89 Board (Side A)

METAL Y adjustment

6. Connect and set the oscilloscope as follows:
Band width limit: ON (20 MHz)
CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
AC 100 mV/DIV
CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
DC 1 V/DIV
TIME: 2 ms/DIV
TRIG: CH-2
7. To perform the tape operation, press the SET button once on the lower control panel.
8. Play back the flat field signal portion (24:00 to 26:00) of the following alignment tape in PLAY mode.
For DNW-A65: CR5-1B
For DNW-A65P: CR5-1B PS
9. To operate the maintenance mode, press the MENU button on the lower control panel.
10. Set the oscilloscope’s trigger to the − slope, then adjust the level of METAL Y-A (ch-A of METAL Y).
Adj. point: A30 : EQ VR : RF GAIN METAL-Y-A
Specification: A = 380 ± 20 mV p-p
11. Set the oscilloscope’s trigger to the + slope, then adjust the level of METAL Y-B (ch-B of METAL Y).
Adj. point: A30 : EQ VR : RF GAIN METAL-Y-B
Specification: A = 380 ± 20 mV p-p
12. While switching the polarity (−/+) of the oscilloscope’s trigger slope, fine adjust the level difference between the METAL Y-A and METAL Y-B until they are identical amplitude.



13. To perform the tape operation, press the SET button once.
14. Stop the playback of the alignment tape.

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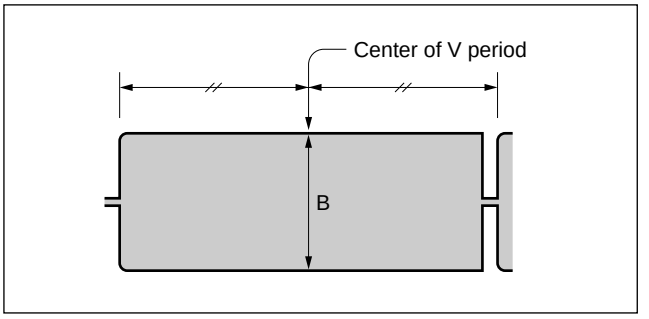
METAL C adjustment

15. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)
    CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
16. Play back the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B / CR5-1B PS in PLAY mode.
17. To operate the maintenance mode, press the MENU button once.
18. Set the oscilloscope's trigger to the − slope, then adjust the level of METAL C-A (ch-A of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-A
    Specification: B = 380 ±20 mV p-p
19. Set the oscilloscope's trigger to the + slope, then adjust the level of METAL C-B (ch-B of METAL C).
    Adj. point: A30 : EQ VR : RF GAIN METAL-C-B
    Specification: B = 380 ±20 mV p-p
20. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the METAL C-A and METAL C-B until they are identical amplitude.



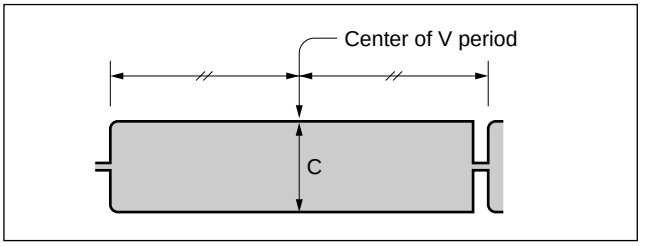
21. To perform the tape operation, press the SET button once.
22. Stop the playback of the alignment tape, then eject it.

OXIDE C adjustment

Note

The connections and settings of the oscilloscope are the same as "METAL C adjustment".

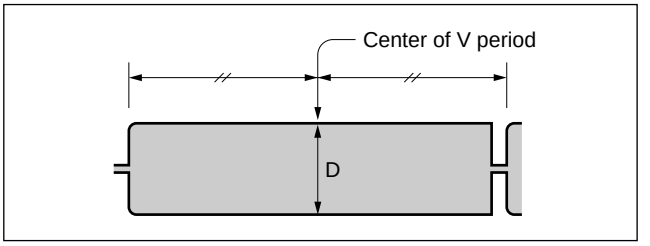
23. Play back the 75% color-bar signal portion (0:00 to 3:00) of the following alignment tape in PLAY mode.
    For DNW-A65: CR5-2A
    For DNW-A65P: CR5-2A PS
24. To operate the maintenance mode, press the MENU button once.
25. Set the oscilloscope's trigger to the − slope, then adjust the level of OXIDE C-A (ch-A of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-A
    Specification: C = 250 ±20 mV p-p
26. Set the oscilloscope's trigger to the + slope, then adjust the level of OXIDE C-B (ch-B of OXIDE C).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE C-B
    Specification: C = 250 ±20 mV p-p
27. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the OXIDE C-A and OXIDE C-B until they are identical amplitude.



28. To perform the tape operation, press the SET button once.
29. Stop the playback of the alignment tape.

OXIDE Y adjustment

30. Change the connection of the oscilloscope as follows: (Keep the setting of the oscilloscope.)
    CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
    CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
31. Play back the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A / CR5-2A PS in PLAY mode.
32. To operate the maintenance mode, press the MENU button once.
33. Set the oscilloscope's trigger to the − slope, then adjust the level of OXIDE Y-A (ch-A of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-A
    Specification: D = 250 ±20 mV p-p
34. Set the oscilloscope's trigger to the + slope, then adjust the level of OXIDE Y-B (ch-B of OXIDE Y).
    Adj. point: A30 : EQ VR : RF GAIN OXIDE Y-B
    Specification: D = 250 ±20 mV p-p
35. While switching the polarity (−/+) of the oscilloscope's trigger slope, fine adjust the level difference between the OXIDE Y-A and OXIDE Y-B until they are identical amplitude

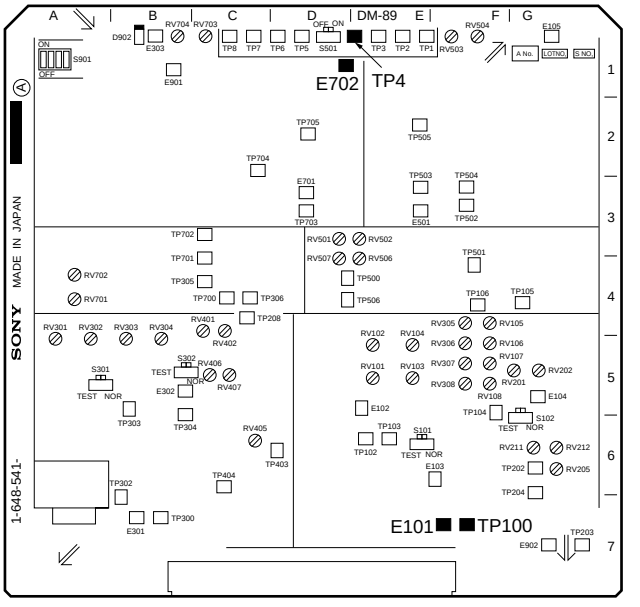


36. To perform the tape operation, press the SET button once.
37. Stop the playback of the alignment tape, then eject it.
38. To operate the maintenance mode, press the MENU button once.
39. To exit A30 : EQ VR, press the MENU button once.

Data save (Store the adjusted data)

40. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    - Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

41. To exit the maintenance mode, press the MENU button four times.



DM-89 Board (Side A)

5-2-7. DM RF Output Level Adjustment (Analog Betacam)

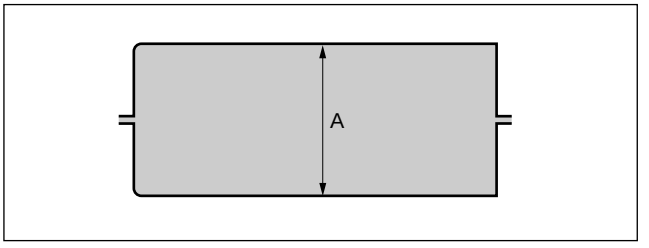
Prepare the following alignment tapes to perform this adjustment.

DNW-A65: CR5-1B and CR5-2A
(for NTSC analog Betacam)
DNW-A65P: CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment: Oscilloscope

METAL Y adjustment

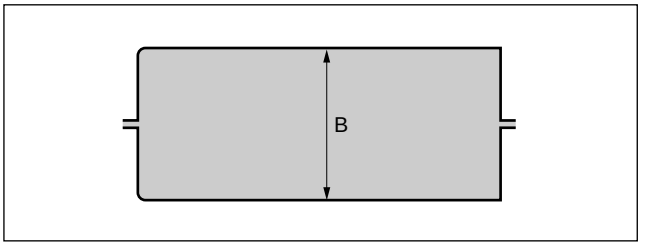
1. Connect and set the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), AC 100 mV/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 2 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV211/DM-89(G-6)
   Specification: A = 400 ±40 mV p-p



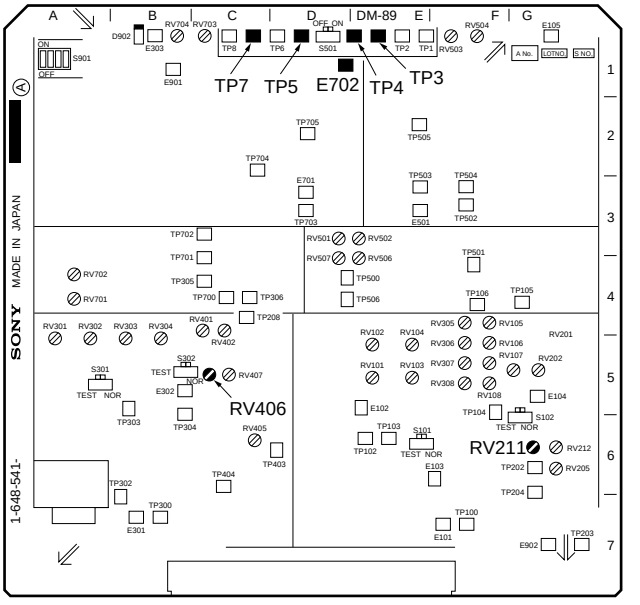
3. Stop the playback of the alignment tape.

METAL C adjustment

4. Change the connection of the oscilloscope as follows:
   CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)
   CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
5. During play back the alignment in PLAY mode, adjust the level at the middle of V period.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV406/DM-89(C-5)
   Specification: B = 400 ±40 mV p-p



6. Stop the playback of the alignment tape, then eject it.



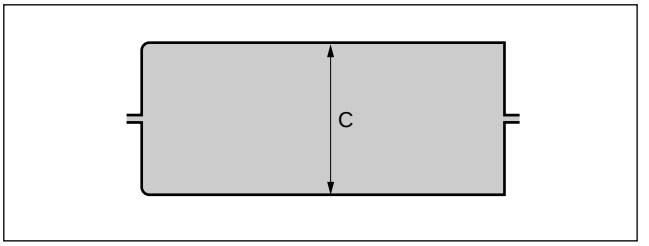
DM-89 Board (Side A)

OXIDE C adjustment

Note

Connection of the oscilloscope remains unchanged.

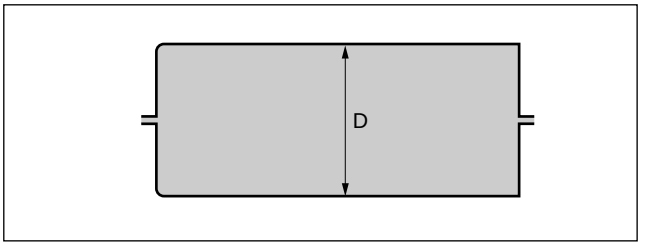
7. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
   PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
   Adj. point: ◓RV407/DM-89(C-5)
   Specification: C = 400 ± 40 mV p-p



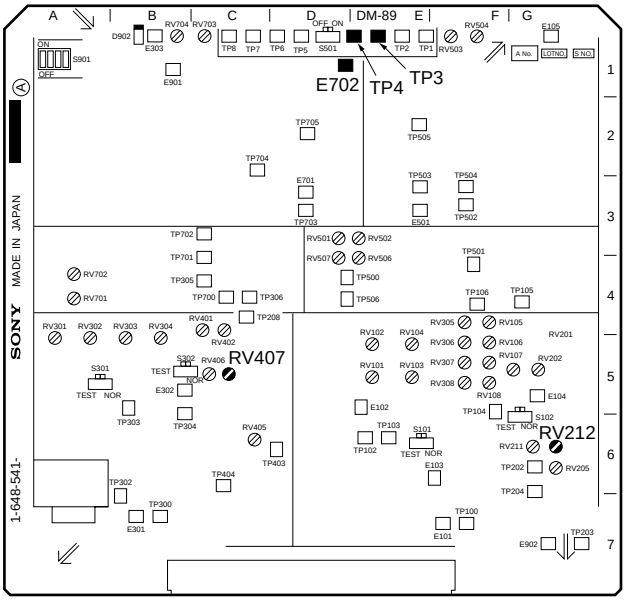
8. Stop the playback of the alignment tape.

OXIDE Y adjustment

9. Change the connection of the oscilloscope as follows:
   CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)
   CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
10. During play back the alignment tape in PLAY mode, adjust the level at the middle of V period.
    PB portion: 75% color-bar signal (0:00 to 3:00) of CR5-2A / CR5-2A PS
    Adj. point: ◓RV212/DM-89(G-6)
    Specification: D = 400 ± 40 mV p-p



11. Stop the playback of the alignment tape.



DM-89 Board (Side A)

5-2-8. OMC Carrier Balance Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

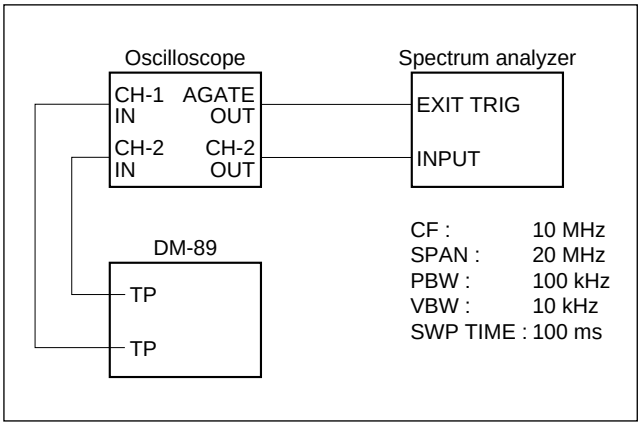
DNW-A65: CR5-1B and CR5-2A
(for NTSC analog Betacam)
DNW-A65P: CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment: Spectrum analyzer
Oscilloscope

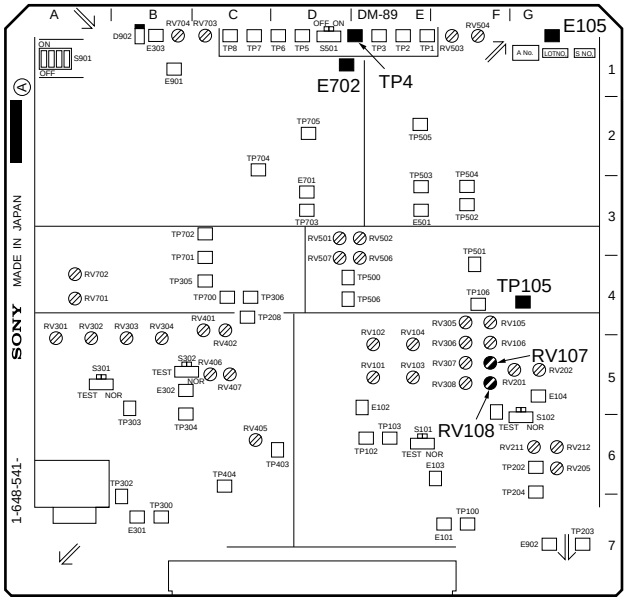
Note

If the network analyzer is not available, perform "5-2-9. OMC Carrier Balance Provisional Adjustment".

1. Connect and set the spectrum analyzer as follows:



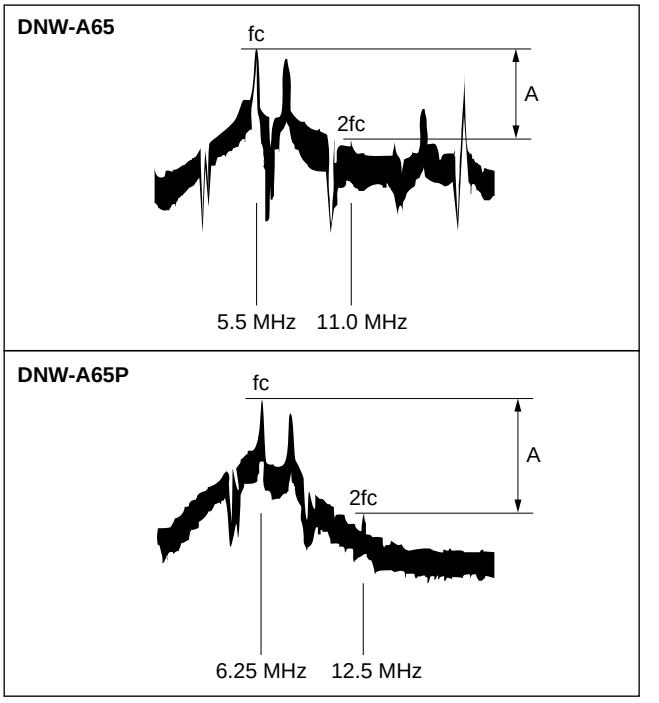
Connection and Setting of Spectrum Analyze



DM-89 Board (Side A)

OXIDE Y adjustment

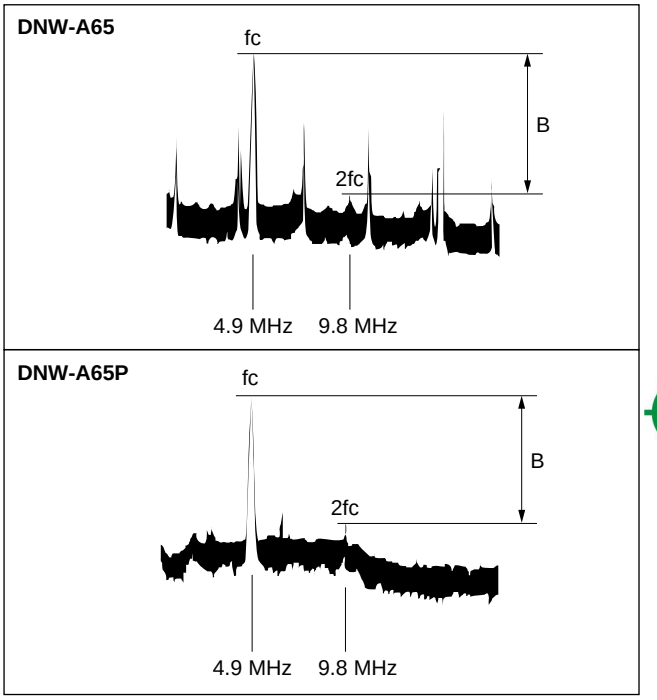
2. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP105/DM-89(G-4), AC 1 V/DIV
   GND: E105/DM-89(G-1)
   TIME: 5 ms/DIV
   TRIG: CH-1, − slope
3. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV107/DM-89(F-5) and ⊘RV108/DM-89(F-5)
   Specification: A ≧ 35 dB



4. Stop the playback of the alignment tape.

OXIDE C adjustment

5. Change the connection of the oscilloscope as follows:
   CH-1: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
   CH-2: TP305/DM-89(C-4), GND: E303/DM-89(B-1)
6. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Pulse & bar signal (9:00 to 11:00) of CR5-2A / CR5-2A PS
   Adj. points: ⊘RV307/DM-89(F-5) and ⊘RV308/DM-89(F-5)
   Specification: B ≧ 35 dB



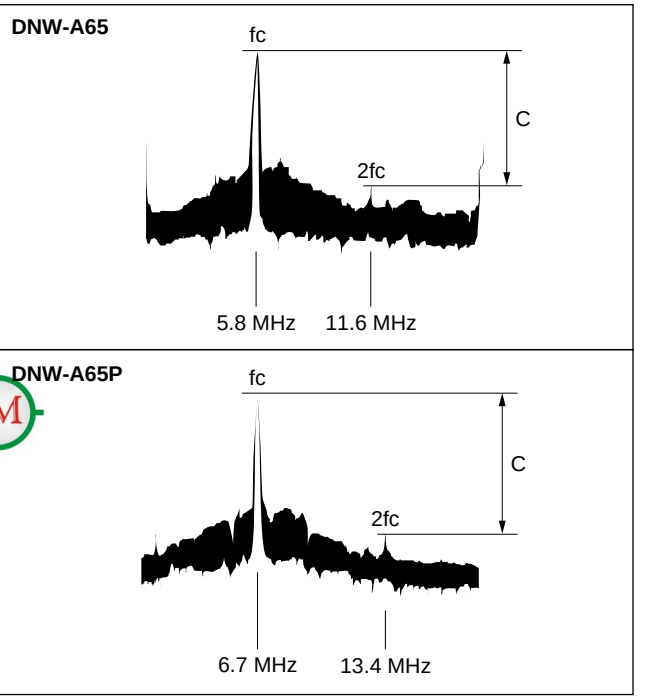
7. Stop the playback of the alignment tape, then eject it.

METAL C adjustment

Note

Connection of the oscilloscope remains unchanged.

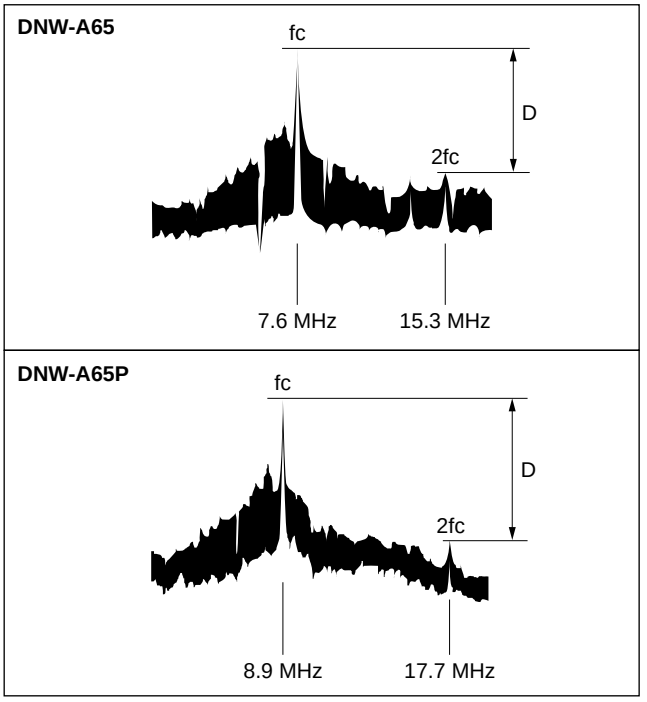
8. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. points: ⊘RV305/DM-89(F-4) and ⊘RV306/DM-89(F-5)
   Specification: C ≧ 40 dB



9. Stop the playback of the alignment tape.

METAL Y adjustment

10. Change the connection of the oscilloscope as follows:
    CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
    CH-2: TP105/DM-89(G-4), GND: E105/DM-89(G-1)
11. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
    PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
    Adj. points: ⊘RV105/DM-89(F-4) and ⊘RV106/DM-89(F-5)
    Specification: D ≧ 40 dB



12. Stop the playback of the alignment tape.

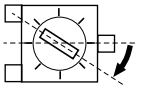
5-2-9. OMC Carrier Balance Provisional Adjustment (Analog Betacam)

Notes

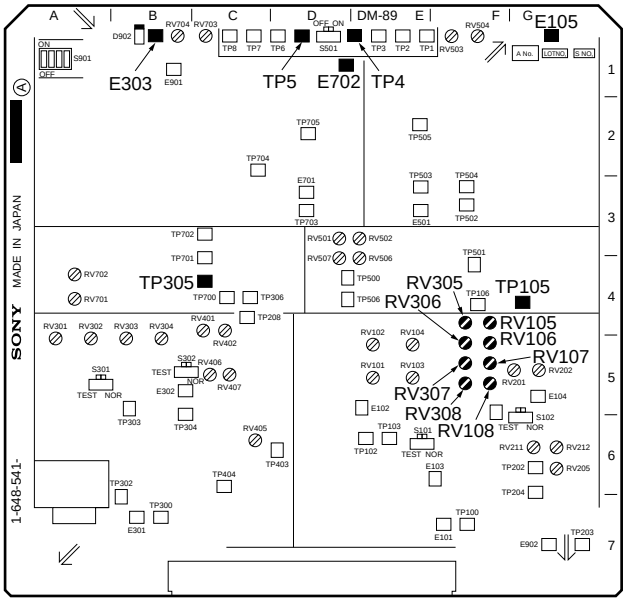
- This provisional adjustment explains how to adjust without using the spectrum analyzer.
  When the performed "5-2-8. OMC Carrier Balance Adjustment" using the spectrum analyzer, this provisional adjustment is not required.
- Perform this provisional adjustment only when the spectrum analyzer is not available for an urgent maintenance. At a later date, be sure to perform "5-2-8. OMC Carrier Balance Adjustment" using the spectrum analyzer.

Settings of RVs

Set the following RVs on the DM-89 board to specified position respectively as shown below.



RV105 (F-4)
RV106 (F-5)
RV107 (F-5)
RV108 (F-5)
RV305 (F-4)
RV306 (F-5)
RV307 (F-5)
RV308 (F-5)



DM-89 Board (Side A)

5-2-10. Demodulator Limiter Balance Adjustment (Analog Betacam)

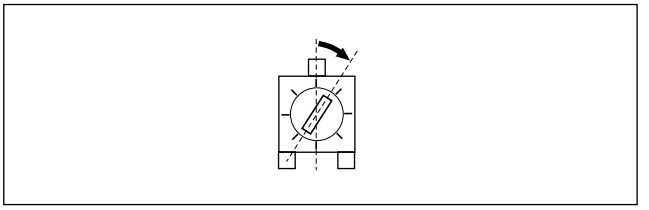
Prepare the following alignment tapes to perform this adjustment.
DNW-A65: CR5-1B (for NTSC analog Betacam)
DNW-A65P: CR5-1B PS (for PAL analog Betacam)

Measuring equipment: Spectrum analyzer
Oscilloscope

Note

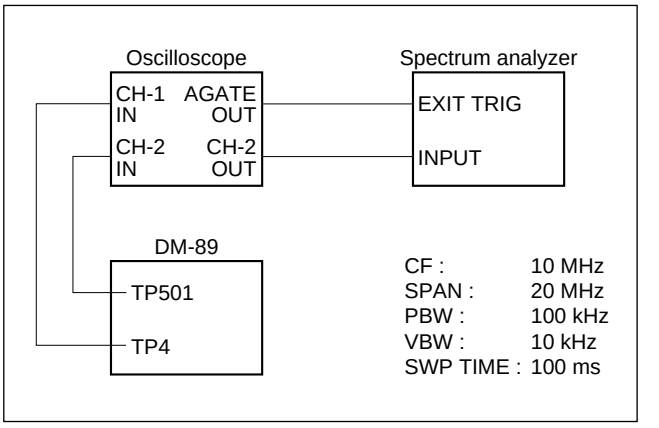
For the Y adjustment:
When the spectrum analyzer is not available for an urgent maintenance, omit steps 2 through 4 in the Y adjustment. Be sure to perform the steps 2 through 4 in the Y adjustment at a later date.

1. Set RV502/DM-89(E-3) to the specified position as shown figure below.



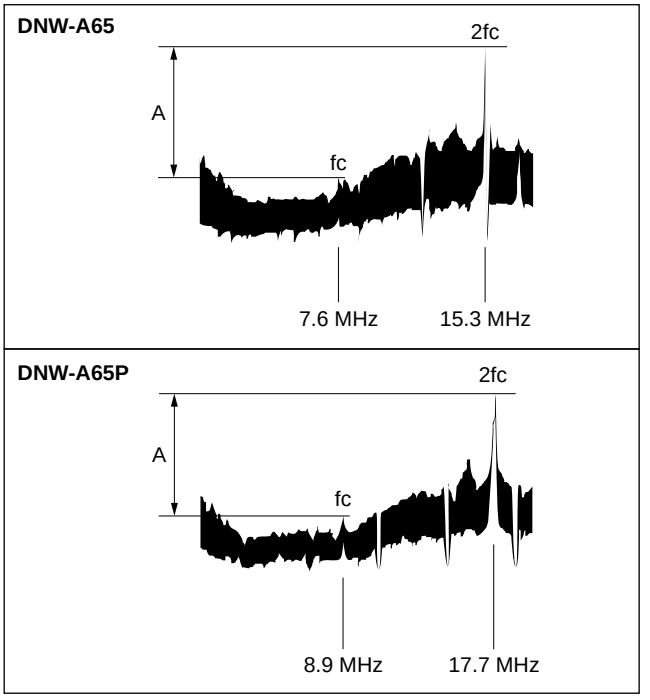
Y adjustment

2. Connect and set the spectrum analyzer as follows:



Connection and Setting of the Spectrum Analyzer

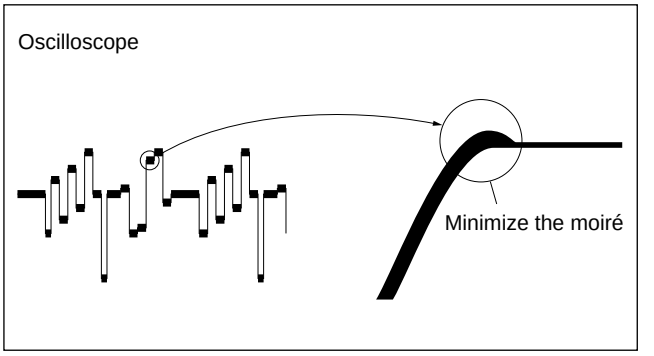
3. Connect and set the oscilloscope as follows:
   CH-1: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   CH-2: TP501/DM-89(F-4), AC 1 V/DIV
   GND: E501/DM-89(E-3)
   TIME: 5 ms/DIV
   TRIG: CH-1, – slope
4. During play back the alignment tape in PLAY mode, adjust the level difference between the fc and 2fc on the spectrum analyzer.
   PB portion: Flat field signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV502/DM-89(E-3)
   Specification: Maximize the level difference A. (Minimize the fc.)



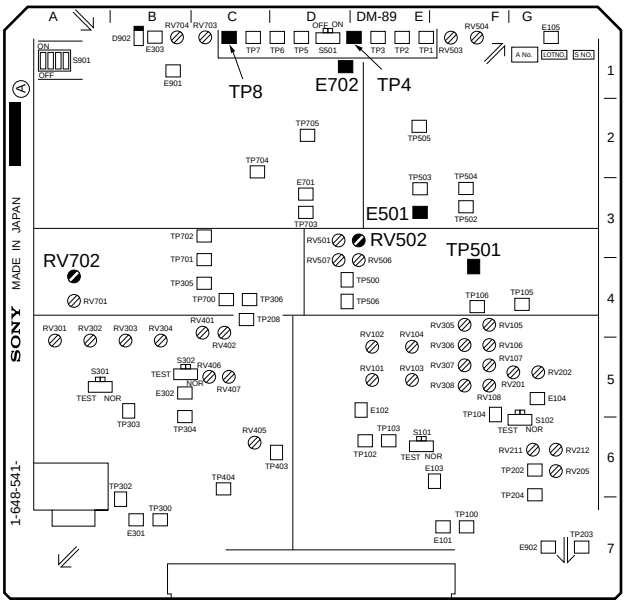
5. Stop the playback of the alignment tape.

C adjustment

6. Connect and set the oscilloscope as follows:
   CH-1: TP8/DM-89(C-1), AC 200 mV/DIV
   GND: E702/DM-89(D-1)
   TIME: 10 µs/DIV
7. During play back the alignment tape in PLAY mode, adjust the moiré of specified part on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ⊘RV702/DM-89(A-4)
   Specification: Minimize the moiré of specified part.



8. Stop the playback of the alignment tape.



DM-89 Board (Side A)

5-2-11. PB Frequency Response Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.

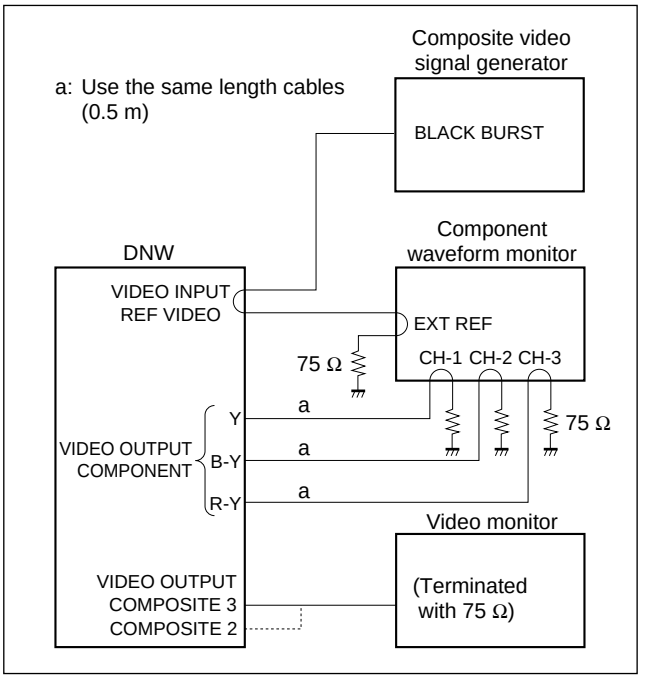
DNW-A65: CR5-1B and CR5-2A
(for NTSC analog Betacam)

DNW-A65P: CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment:

Analog composite signal generator
Analog component waveform monitor

1. Connect the equipment as follows :



2. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
3. Enter A32 : DM VR 1.
4. To perform the tape operation, press the SET button once.

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METAL Y adjustment

5. Watch the Y output signal on the analog component waveform monitor.

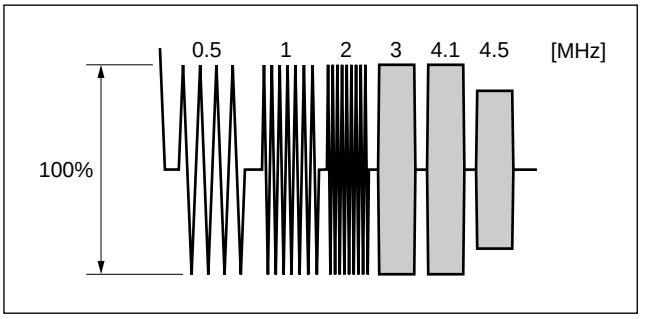
   Note

   As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
6. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A65) / 2T BAR (DNW-A65P).
   PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
   This measured level is reference level 100% (0 dB).
7. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
   PB portion: The same as step 6
8. To operate the maintenance mode, press the MENU button once.
9. Adjust the level at 4.1 MHz (DNW-A65) / 5 MHz (DNW-A65P).
   PB portion: The same as step 6
   Adj. points:
   A channel: A32 : DM VR 1 : EQ1 METAL-Y-A
   B channel: A32 : DM VR 1 : EQ1 METAL-Y-B
   Specification (A and B channels):
   See the table below.
10. To perform the tape operation, press the SET button once.
11. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 6
    Specification (A and B channels):
    See the table below.

12. Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
13. During play back the alignment tape in PLAY mode, check the playback picture on the video monitor.
    PB portion: The same as step 6
    Specification: It has not flicker.
14. Reconnect the video monitor to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.

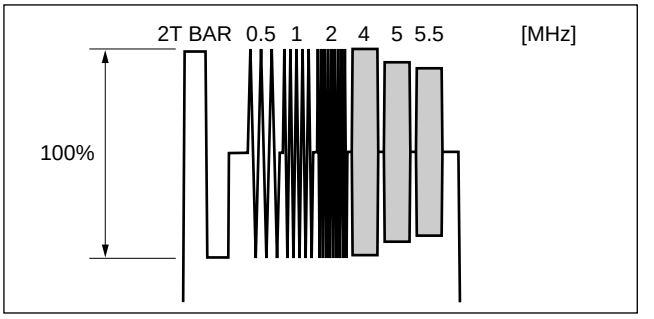
Specifications (METAL Y) for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
4.1 MHz	Adjust: 94% (100 to 90%) {−0.5 $^{+0.5}_{-0.4}$ dB}
1 MHz 2 MHz 3 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-4.0}$ dB}
4.5 MHz	Check: 80% (106 to 63%) {−2.0 $^{+2.5}_{-2.0}$ dB}



Specifications (METAL Y) for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 2T BAR is 100% {0 dB}.)
5 MHz	Adjust: 91% (96 to 87%) {−0.8 ±0.4 dB}
0.5 MHz 1 MHz 2 MHz 4 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-4.0}$ dB}
5.5 MHz	Check: 84% (106 to 63%) {−1.5 $^{+2.0}_{-2.5}$ dB}



METAL C adjustment

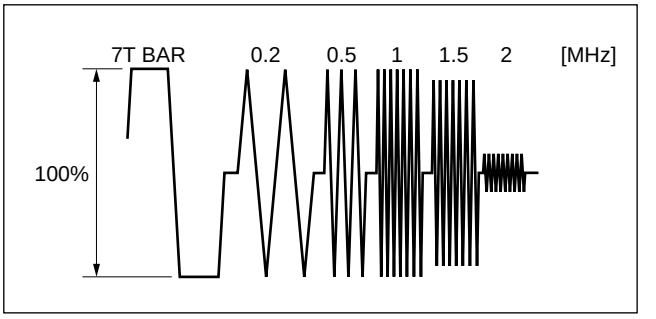
15. Watch the R-Y output signal on the analog component waveform monitor.

    Note

    As the R-Y(B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
16. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A65) / 8T BAR (DNW-A65P).
    PB portion: Multi-burst signal (8:00 to 11:00) of CR5-1B / CR5-1B PS
    This measured level is reference level 100% (0 dB).
17. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
    PB portion: The same as step 16
18. To operate the maintenance mode, press the MENU button once.
19. Adjust the level at 1 MHz (DNW-A65) / 1.5 MHz (DNW-A65P).
    PB portion: The same as step 16
    Adj. points:
    A channel: A32 : DM VR 1 : EQ1 METAL-C-A
    B channel: A32 : DM VR 1 : EQ1 METAL-C-B
    Specifications (A and B channels):
    See the table below.
20. To perform the tape operation, press the SET button once.
21. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 16
    Specifications (A and B channels):
    See the table below.
22. Watch the B-Y output signal on the component waveform monitor.
23. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
24. Eject the alignment tape.

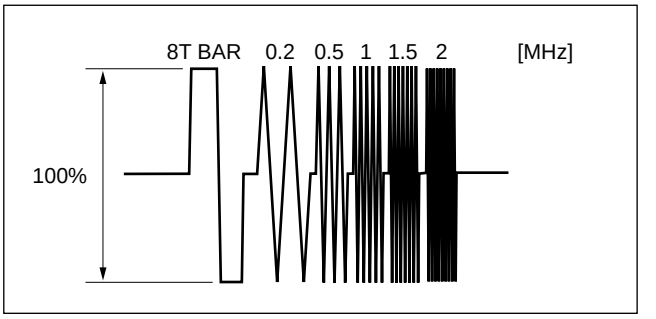
Specifications (METAL C) for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
1 MHz	Adjust: 94% (100 to 89%) {−0.5 ±0.5 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 63%) {0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications (METAL C) for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 8T BAR is 100% {0 dB}.)
1.5 MHz	Adjust: 93% (102 to 85%) {−0.6 ±0.8 dB}
0.2 MHz 0.5 MHz 1 MHz	Check: 100% (106 to 71%) {0 $^{+0.5}_{-3.0}$ dB}
2 MHz	Check: 80% (106 to 71%) {−2.0 $^{+2.5}_{-1.0}$ dB}



OXIDE Y adjustment

25. Watch the Y output signal on the analog component waveform monitor.

    Note

    As the Y output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
26. During play back the alignment tape in PLAY mode, measure level at 0.5 MHz (DNW-A65) / 2T BAR (DNW-A65P).
    PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
    This measured level is reference level 100% (0 dB).
27. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
    PB portion: The same as step 26
28. To operate the maintenance mode, press the MENU button once.
29. Adjust the level at 2 MHz (DNW-A65) / 3 MHz (DNW-A65P).
    PB portion: The same as step 26
    Adj. points:
    A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A
    B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B
    Specifications (A and B channels):
    See the table below.
30. To perform the tape operation, press the SET button once.
31. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 26
    Specifications (A and B channels):
    See the table below.

32. During play back the alignment tape in PLAY mode, check the output level difference between A and B channels at high frequency (4.5 MHz) part.
    PB portion: The same as step 26
    Specification: It is not noticeable.

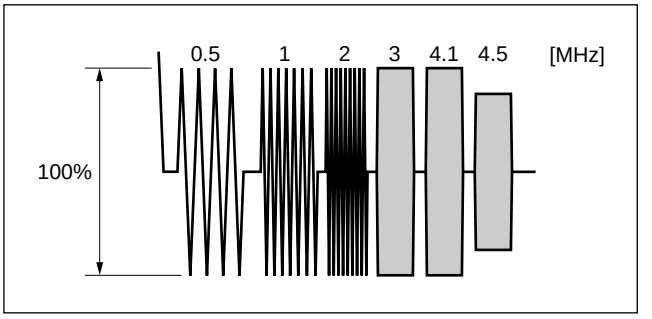
    Note

    If the output level difference of A and B channels at 4.5 MHz part is noticeable, change the data of “SUB OXIDE-Y-A” or “SUB OXIDE-Y-B” in A34 : DM VR 3 as following steps (1) to (8).

(1) To operate the maintenance mode, press the MENU button once.
(2) To exit A32 : DM VR 1, press the MENU button once.
(3) Enter A34 : DM VR 3.
(4) Change the data of “SUB OXIDE-Y-A” (A channel side), and judge a lower level channel.

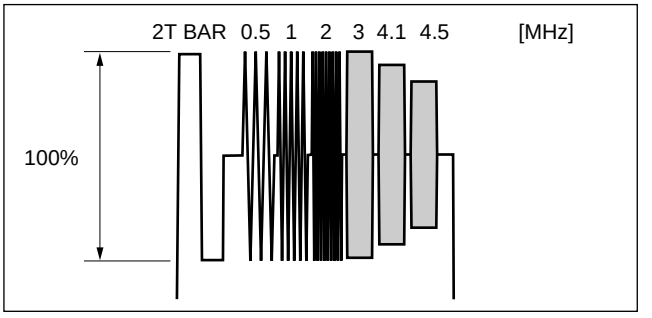
Specifications (OXIDE Y) for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)
2 MHz	Adjust: 100% (104 to 95%) {0 $^{+0.3}_{-0.4}$ dB}
1 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
3 MHz	Check: 89% (106 to 50%) {–1.0 $^{+1.5}_{-5.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



Specifications (OXIDE Y) for DNW-A65P

Frequency	Specification for DNW-A65P (Level at 2T BAR is 100% {0 dB}.)
3 MHz	Adjust: 89% (100 to 79%) {–1.0 ±1.0 dB}
0.5 MHz 1 MHz, 2 MHz	Check: 100% (106 to 50%) {0 $^{+0.5}_{-6.0}$ dB}
4.1 MHz	Check: 71% (106 to 50%) {–3.0 $^{+3.5}_{-3.0}$ dB}



(5) If the B channel side is lower: Return the data of “SUB OXIDE-Y-A” to the former data, then adjust (add to the data value) “SUB OXIDE-Y-B” until the level at 4.5 MHz of B channel is equal to the level at 4.5 MHz of A channel.
    If the A channel side is lower: Adjust (add to the data value) “SUB OXIDE-Y-A” until the level at 4.5 MHz of A channel is equal to the level at 4.5 MHz of B channel.
(6) To exit A34 : DM VR 3, press the MENU button once.
(7) Enter A32 : DM VR 1.
(8) To perform the tape operation, press the SET button once.

OXIDE C adjustment

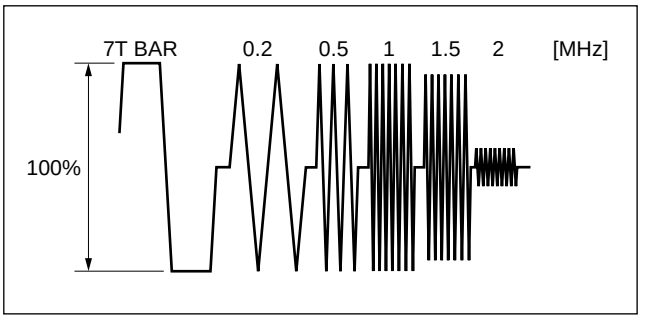
33. Watch the R-Y output signal at the analog component waveform monitor.

    Note

    As the R-Y (B-Y) output is overlapped the outputs of A channel and B channel on the component waveform monitor, adjust/check the level at each channel.
34. During play back the alignment tape in PLAY mode, measure level at 7T BAR (DNW-A65) / 8T BAR (DNW-A65P).
    PB portion: Multi-burst signal (3:00 to 6:00) of CR5-2A / CR5-2A PS
    This measured level is reference level 100% (0 dB).
35. Restart the playback of alignment tape from the top of PB portion in PLAY mode.
    PB portion: The same as step 34
36. To operate the maintenance mode, press the MENU button once.
37. Adjust the level at 1 MHz.
    PB portion: The same as step 34
    Adj. points:
    A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A
    B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B
    Specifications (A and B channels):
    See the table below.
38. To perform the tape operation, press the SET button once.
39. During play back the alignment tape in PLAY mode, check each level at the other frequency parts.
    PB portion: The same as step 34
    Specifications (A and B channels):
    See the table below.
40. Watch the B-Y output signal on the component waveform monitor.
41. Check that the B-Y output signal levels at every frequencies are within specifications shown below. If the B-Y output signal is out of specifications, perform fine adjustment for R-Y until the specifications for R-Y and B-Y output signals.
42. Eject the alignment tape.
43. To operate the maintenance mode, press the MENU button once.
44. To exit A32 : DM VR 1, press the MENU button once.

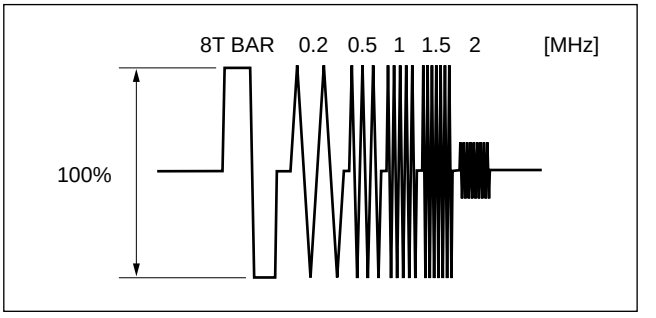
Specifications (OXIDE C) for DNW-A65

Frequency	Specification for DNW-A65 (Level at 0.5 MHz is 100% {0 dB}.)	
1 MHz	Adjust: 94% (100 to 89%)	{−0.5 ±0.5 dB}
0.2 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
0.5 MHz	Check: 95% (106 to 71%)	{−0.4 $^{+0.9}_{-2.6}$ dB}
1.5 MHz	Check: 80% (106 to 71%)	{−2.0 $^{+2.5}_{-1.0}$ dB}



Specifications (OXIDE C) for DNW-A65P

Frequency	Specification for DNW-A65P (level at 8T BAR is 100% {0 dB}.)	
1 MHz	Adjust: 94% (102 to 86%)	{−0.5 ±0.8 dB}
0.2 MHz 0.5 MHz	Check: 100% (106 to 71%)	{0 $^{+0.5}_{-3.0}$ dB}
1.5 MHz	Check: 84% (106 to 71%)	{−1.5 $^{+2.0}_{-1.5}$ dB}



Data save (Store the adjusted data)

45. Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
    • Message "Save Complete" is displayed on the video monitor when this data save is completed normally.

    Note

    When loading the previous data without save the current adjusted data, execute "ALL DATA PREVIOUS".
46. To exit the maintenance mode, press the MENU button four times.

5-2-12. DM RF Output Level Readjustment (Analog Betacam)

Readjust the DM RF output level referring to Section 5-2-7 again.

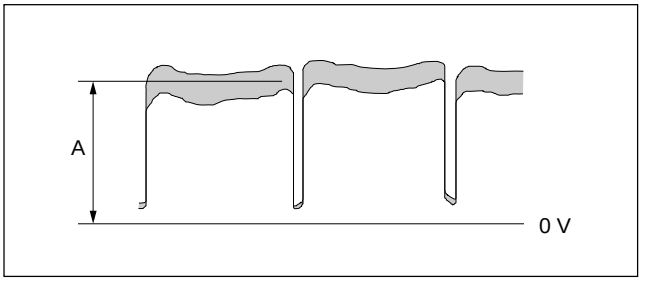
5-2-13. RF Envelope Adjustment (Analog Betacam)

Prepare the following alignment tapes to perform this adjustment.
DNW-A65: CR5-1B (for NTSC analog Betacam)
DNW-A65P: CR5-1B PS (for PAL analog Betacam)

Measuring equipment: Oscilloscope

Y adjustment

1. Connect and set the oscilloscope as follows:
   CH-1: TP203/DM-89(G-7), DC 500 mV/DIV
   GND: E902/DM-89(G-7)
   CH-2: TP4/DM-89(E-1), DC 1 V/DIV
   GND: E702/DM-89(D-1)
   TIME: 5 ms/DIV
   TRIG: CH-2, – slope
2. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV205/DM-89(G-6)
   Specification: A = 2.0 ±0.2 V dc

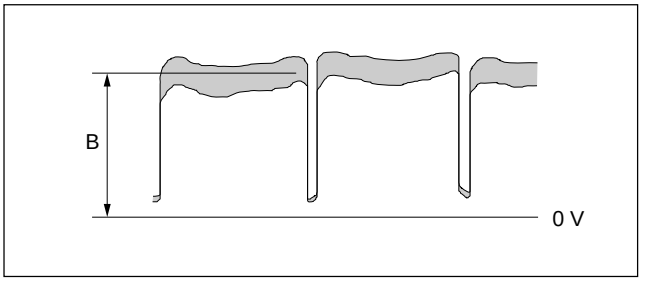


3. Stop the playback of the alignment tape.

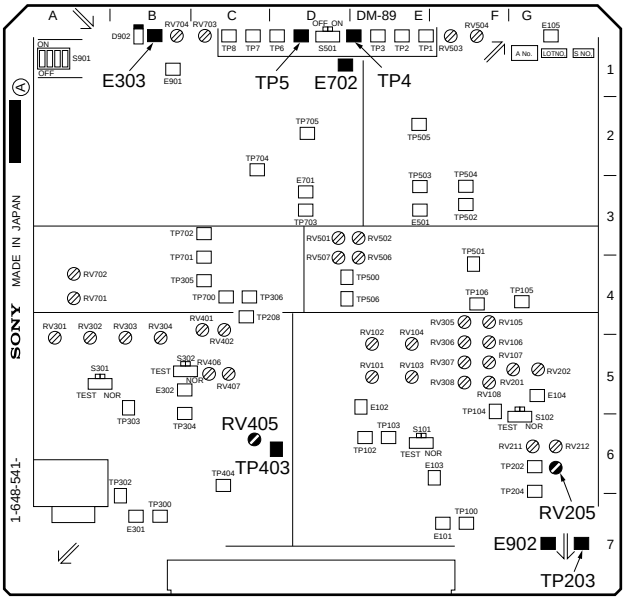
C adjustment

4. Change the connection of the oscilloscope as follows:
   CH-1: TP403/DM-89(D-6)
   GND: E303/DM-89(B-1)
   CH-2: TP5/DM-89(D-1)
   GND: E702/DM-89(D-1)

5. During play back the alignment tape in PLAY mode, adjust the DC level at CH-1 on the oscilloscope.
   PB portion: Flat filed signal (24:00 to 26:00) of CR5-1B / CR5-1B PS
   Adj. point: ◓RV405/DM-89(C-6)
   Specification: B = 2.0 ±0.2 V dc



6. Stop the playback of the alignment tape.



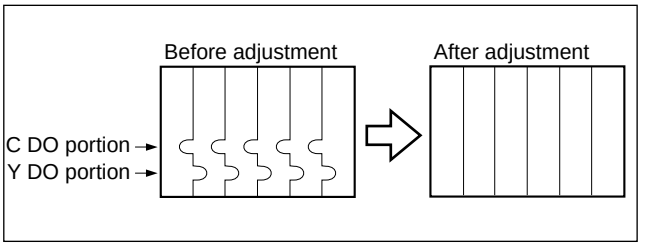
DM-89 Board (Side A)

5-2-14. Impact Error Offset Adjustment (Analog Betacam)

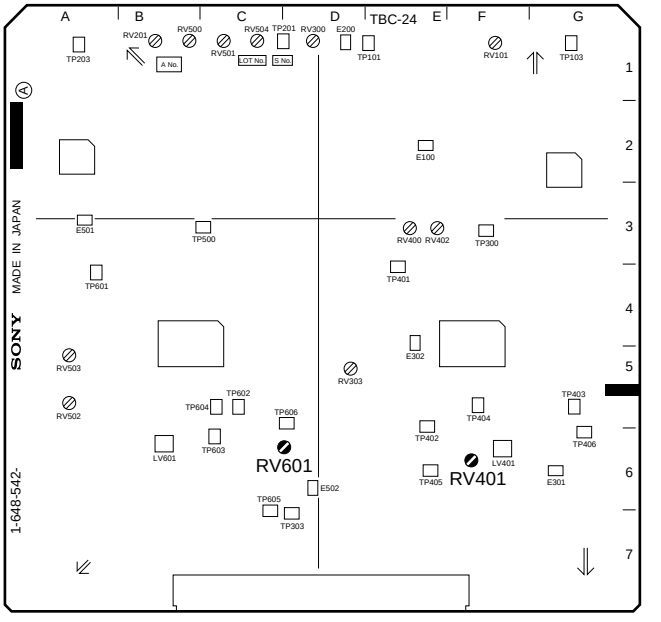
Prepare the following alignment tape.
DNW-A65: CR5-1B (for NTSC analog Betacam)
DNW-A65P: CR5-1B PS (for PAL analog Betacam)

Measuring equipment: Video monitor

1. Turn off the power.
2. Stop the exteuion of the DM-89 board.
3. Extend the TBC-24 board with an extension board EX-377 and an extension harness (14P).
4. Turn on the power.
5. Set the CHARACTER switch to OFF.
6. Start the playback of alignment tape in PLAY mode.
   PB portion: Color-bar signal with the drop-out (26:00 to 28:00) of CR5-1B / CR5-1B PS
7. Check that the Y DO and C DO parts of playback picture (displaying color-bar) is no dorp-out.
   If drop-out is appeared, adjust the following RVs.
   Adj. points: Y DO: ⊘RV401/TBC-24(F-6)
   C DO: ⊘RV601/TBC-24(D-6)
   Specification: No dorp-out (on C DO and Y DO)



8. Stop the playback of the alignment tape.
9. Return the CHARACTER switch to ON.
10. Turn off the power.
11. Stop the extension of the TBC-24 board.
12. Turn on the power.



TBC-24 Board (Side A)

5-2-15. TBC Y/C Delay Adjustment (Analog Betacam)

Note

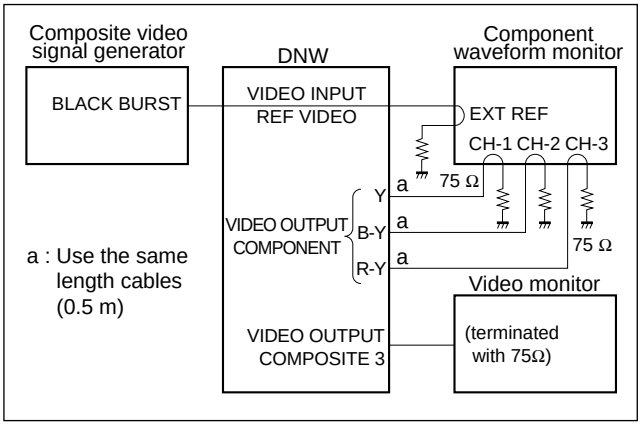
Be sure to perform this adjustment without using the extension board.

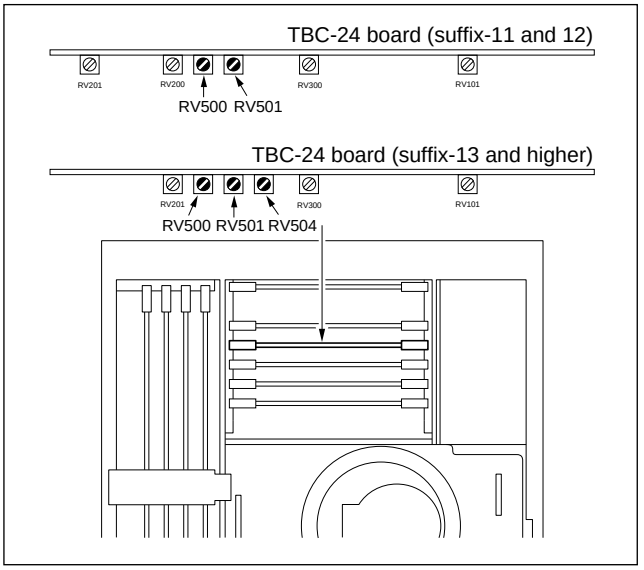
Prepare the following alignment tapes to perform this adjustment.

DNW-A65: CR5-1B and CR5-2A
(for NTSC analog Betacam)
DNW-A65P: CR5-1B PS and CR5-2A PS
(for PAL analog Betacam)

Measuring equipment:
Analog composite signal generator
Analog component waveform monitor

1. Connect the equipment as follows:





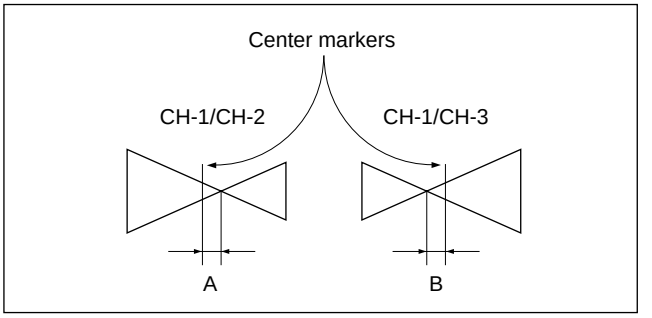
RV500, RV501, and RV504 on TBC-24 Board

METAL adjustment

2. Set the component waveform monitor to BOWTIE mode.
3. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (17:00 to 19:00) of CR5-1B / CR5-1B PS
4. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. points: Field 1:⊘RV500/TBC-24(B-1)
   Field 2:⊘RV504/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns

   Note

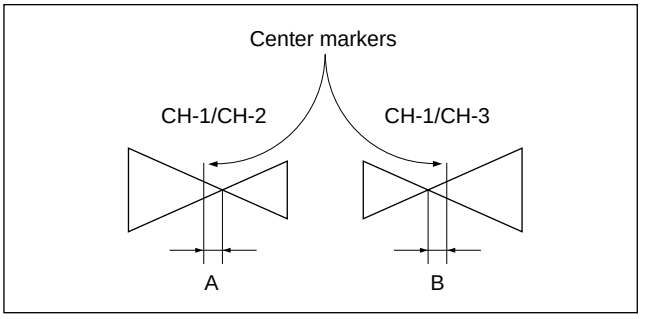
   As the TBC-24 board of the board number suffixes 11 and 12 is without RV504, adjust RV500 only.



5. Stop the playback of the alignment tape, then eject it.

OXIDE adjustment

6. Start the playback of alignment tape in PLAY mode.
   PB portion: 50% bowtie signal (6:00 to 9:00) of CR5-2A / CR5-2A PS
7. Adjust the deviations A and B between each center marker and bowtie dip point of CH-1/CH-2 (Y/B-Y) and CH-1/CH-3 (Y/R-Y).
   Adj. point: ⊘RV501/TBC-24(C-1)
   Specifications: A = 0 ±10 ns
   B = 0 ±10 ns



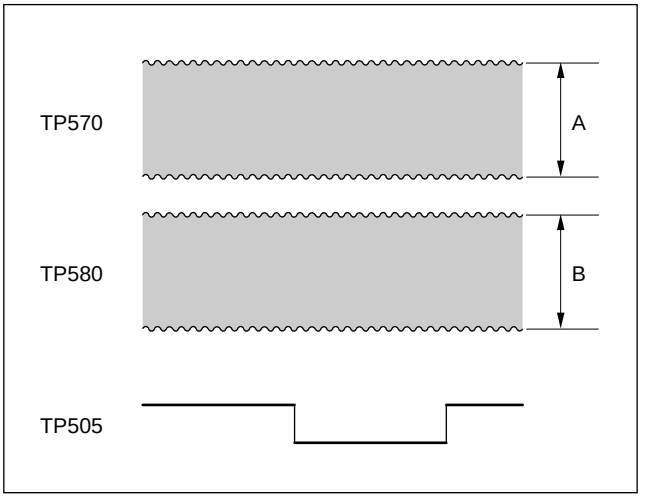
8. Stop the playback of the alignment tape, then eject it.

5-2-16. AFM RF Level Adjustment (Betacam SP)

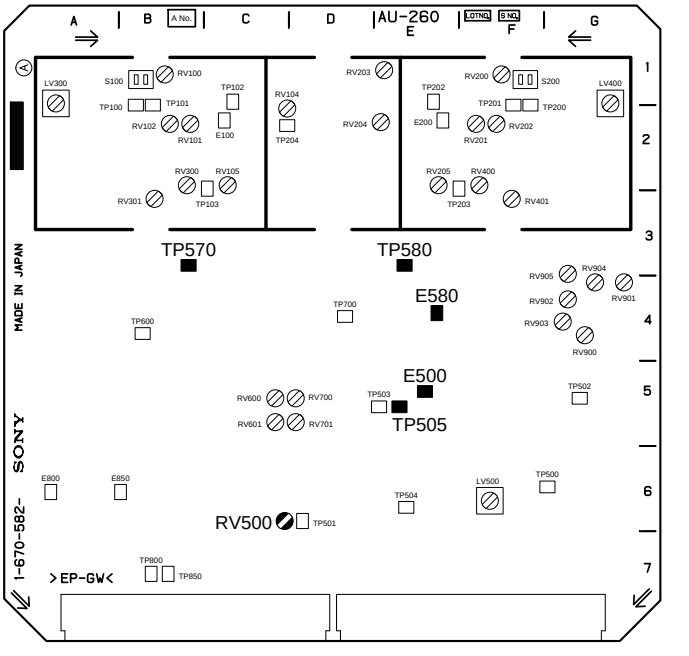
Prepare the following alignment tape to perform this adjustment.
DNW-A65: CR5-1B (for NTSC analog Betacam)
DNW-A65P: CR5-1B PS (for PAL analog Betacam)

Measuring equipment: Oscilloscope

1. Turn off the power.
2. Extend the AU-260 board with extension board EX-556.
3. Turn on the power.
4. Connect and set the oscilloscope as follows:
   Band width limit: ON (20 MHz)
   CH-1: TP570/AU-260(B-3) ,
   GND: E580/AU260(E-4)
   CH-2: TP580/AU-260(E-3) ,
   GND: E500/AU260(E-5)
   TRIG: TP505/AU-260(E-5) ,
   GND: E500/AU260(E-5)
   TIME: 5 ms/DIV
5. Play back the 400 Hz (with 25 kHz deviation) portion (14:00 to 16:30) of the alignment tape CR5-1B or CR5-1B PS in PLAY mode.
6. Check the RF levels of waveforms on the oscilloscope. If the speification is not satisfied, adjustment.
   Adj. point: ⊘RV500/AU-260(C-6)
   Specifications: A = 450 ±100 mV p-p
   B = 450 ±100 mV p-p



7. Stop the playback of the alignment tape, then eject it.



AU-260 Board (Side A)

5-2-17. DT Offset Level Adjustment (Another Video System) (Analog Betacam)

Prepare the following alignment tape to perform this adjustment.

DNW-A65: CR5-1B PS or CR5-2A PS
(for PAL analog system)
DNW-A65P: CR5-1B or CR5-2A
(for NTSC analog system)

Offset level adjustment

1. Switch the video system of the unit using the setup menu ITEM-013 : 525/625 SYSTEM SELECT, and switch the video system of the composite video momitor.
   DNW-A65: 625/50 system
   DNW-A65P: 525 60 system
   (For the ITEM-013, refer to Section 6-2-2 of the operation manual.)
2. Insert the alignment tape, then advances it to the following time code.
   CR5-1B / CR5-1B PS: Time code 00:14:00:00
   CR5-2A / CR5-2A PS: Time code 00:00:00:00
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A030 : HEAD OFFSET LEVEL.
   - The alignment tape is ejected on the way to menu A030.
5. Insert the alignment tape again.
6. Press the SET button.
   - Message “Push PLAY button” is displayed on the video monitor.
7. Press the PLAY button.
   - The automatic adjustment is initiated.
   - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
8. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

9. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
   - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
10. To exit the maintenance mode, press the MENU button five times.
    - The alignment tape is ejected automatically.

Drive gain adjustment

11. Insert the alignment tape, then advances it to the following time code.
    CR5-1B / CR5-1B PS: Time code 00:14:00:00
    CR5-2A / CR5-2A PS: Time code 00:00:00:00
12. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
13. Enter A031 : DRIVE GAIN.
    - The alignment tape is ejected on the way to menu A031.
14. Insert the alignment tape again.
15. Press the SET button.
    - Message “Set VARIABLE × 3” is displayed on the video monitor.
16. Press the VAR button.
    - The VAR button is lit, and the search dial is entered the VARIABLE mode.
17. Turn the search dial in the FORWARD (↻) direction to enter the VARIABLE × 3 mode.
    - The automatic adjustment is initiated when entering the VARIABLE × 3 mode.
    - Message “ADJUST COMPLETE” is displayed on the video monitor when this automatic adjustment is completed normally.
18. Press the JOG button.
    - The JOG button is lit, and the search dial is entered the JOG mode.
19. To exit this menu, press the MENU button once.

Data save (Store the adjusted data)

20. Enter A032 : DATA SAVE, then execute “SAVE ANALOG DT DATA”.
    - Message “DATA SAVED” is displayed on the video monitor when this data save is completed normally.
21. To exit the maintenance mode, press the MENU button five times.
    - The alignment tape is ejected automatically.

Perfection

22. Switch the video system of the unit using the ITEM-013, and switch the video system of the video monitor.
    DNW-A65: 525/60 system
    DNW-A65P: 625/50 system
23. Return the settings of the setup extend menus ITEM-709 and ITEM-713 to the customer setting.
    (Refer to Section 5-2-2.)

5-3. Electrical Adjustment after Replacing the AT Head

5-3-1. Adjustment Overview

Perform this section when the AT head was replaced.

For adjustment items and its order, refer to “Adjustment Items” on next page.

Tools List

To perform the electrical adjustments, the following equipment and fixtures are required.

- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent

  Note

  The audio analyzer should be filtered through 80 kHz LPF throughout adjustment.
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Time code reader
  For DNW-A65: SONY BVG-1500 or equivalent
  For DNW-A65P: SONY BVG-1500P or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Analog composite video monitor

  Note

  This monitor is for menu displaying. Be sure to connect it to VIDEO OUTPUT COMPOSITE 3 (SUPER) connector.
- Extension board: EX-556 (Part No. A-8277-212-A)
- Shorting clip
- Alignment tapes
  For DNW-A65: CR8-1A (Part No. 8-960-097-45) and
  SR5-1 (Part No. 8-960-075-01)
  For DNW-A65P: CR8-1A PS (Part No. 8-960-098-45),
  CR8-1B PS (Part No. 8-960-096-86), and
  SR5-1P (Part No. 8-960-075-51)
- Recorded SX tape: BCT-SX series (Betacam SX cassette)
  (Sony’s standard products)

  Note

  Be sure to prepare a Betacam SX cassette tape that recorded the time code to the TC track using a Betacam SX videocassette recorder in advance.

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Adjustment Items

No.	Item	Adjustment point		Test point
5-3-2	Preparation			
5-3-3	LAU PB frequency response adjustment (Audio head dumping adjustment)			
	OXIDE	CH1	⊘RV101/AU-260(B-2) ⊘RV100/AU-260(B-1) [S100/AU-260(B-1)]	AUDIO OUTPUT CH1
		CH2	⊘RV201/AU-260(F-2) ⊘RV200/AU-260(F-1) [S200/AU-260(F-1)]	AUDIO OUTPUT CH2
	METAL (DNW-A65P only)	CH1	⊘RV102/AU-260(B-2)	AUDIO OUTPUT CH1
		CH2	⊘RV202/AU-260(F-2)	AUDIO OUTPUT CH2
5-3-4	LAU Dolby level adjustment	CH1	⊘RV204/AU-260(C-2)	TP103/AU-260(C-2)
		CH2	⊘RV204/AU-260(E-2)	TP203/AU-260(F-2)
5-3-5	LAU PB level Adjustment	CH1	⊘RV105/AU-260(C-2)	AUDIO OUTPUT CH1
		CH2	⊘RV205/AU-260(E-2)	AUDIO OUTPUT CH2
5-3-6	LAU PB phase adjustment		⊘RV203/AU-260(E-1)	AUDIO OUTPUT CH1/CH2
5-3-7	LTC Erasure current adjustment		⊘LV300/TC-102(A-1)	TP301/TC-102(B-1), TP300/TC-102(B-1)
5-3-8	LTC PB level check		check	TP102/TC-102(A-2)
5-3-9	LTC OA check		REC check	TP100/TC-102(A-3), TP101/TC-102(A-2)
			PB and Erase ratio check	TP102/TC-102(A-2)

5-3-2. Common Preparation

Perform the settings (shorting plugs, control panels, setup menu, etc.) toward the VTR before starting the adjustments.
Return they settings to the customer settings after completing the audio system alignment.

1. Setting the shorting plugs on APR-40 board

Reset the shorting plugs of APR-40 board to the factory settings.

Note

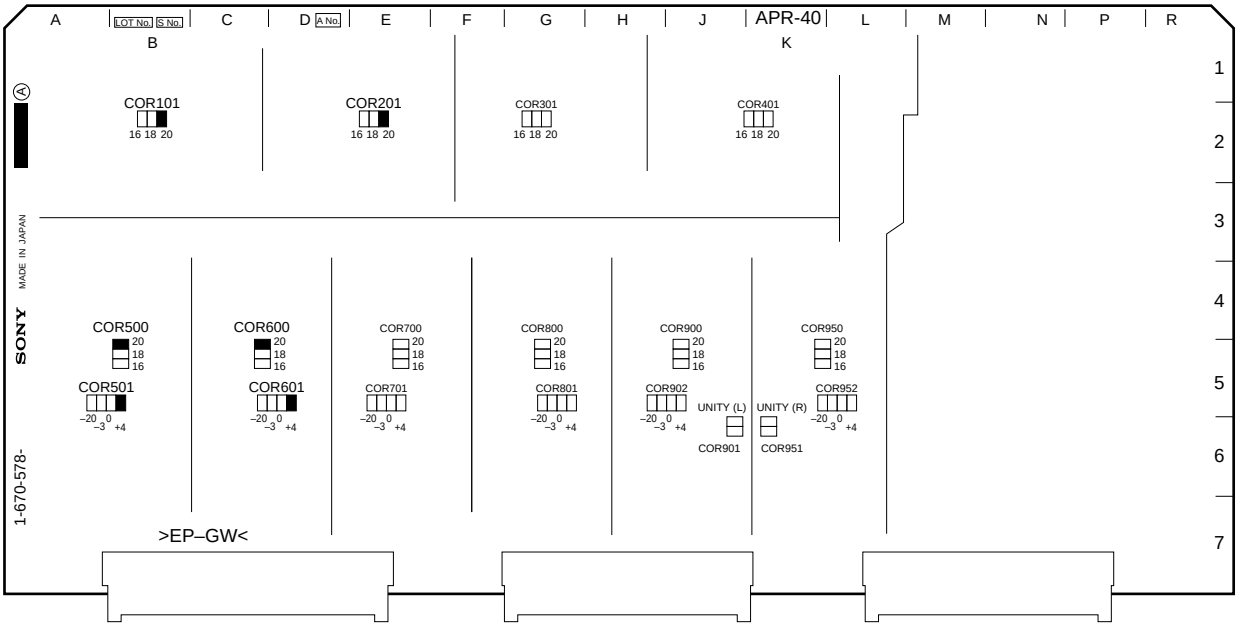
Turn off the power before removing the APR-40 board and changing the shorting plugs setting.

Ref. No. (Address)	Item	Customer setting	Factory setting
COR101 (B-2)	Analog audio CH1 input headroom	_____	⇨ 20
COR201 (E-2)	Analog audio CH2 input headroom	_____	⇨ 20
COR500 (B-5)	Analog audio CH1 output headroom	_____	⇨ 20
COR501 (B-5)	Analog audio CH1 output level	_____	⇨ +4
COR600 (C-5)	Analog audio CH2 output headroom	_____	⇨ 20
COR601 (D-5)	Analog audio CH2 output level	_____	⇨ +4

2. Extend the AU-260 board with an extension board EX-556.

Note

Perform under the power off.



APR-40 Board (Side A)

3. Others settings (except the menu setting)

Location	Item		Customer setting	Setting at adjustment
SS-83 board	DIP switch S1100 (M-1)	No. 1	_____	⇨ ON (Set to the up position)
	Note Set to ON to treat the extended menu of the setup menu.			
Upper control panel	PB (audio level) controls	CH1	_____	⇨ PRESET
		CH2	_____	⇨ PRESET
		CH3	_____	⇨ PRESET
		CH4	_____	⇨ PRESET
	TC (LTC/AUTO/VISC)		_____	⇨ LTC
	REMOTE:	9P	_____	⇨ Off (Light off)
		50P	_____	⇨ Off (Light off)
Sub control panel	CHARACTER switch		_____	⇨ ON
	DOLBY NR switch		_____	⇨ OFF
	GOOD SHOT switch		_____	⇨ REC
	KEY INHIBIT switch		_____	⇨ OFF

4. Video system check

Be sure to adjust in the following system.
DNW-A65: 525/60 system
DNW-A65P: 625/50 system

If differed, change the video system using the setup menu ITEM-013 before adjusting.
(For the ITEM-013, refer to Section 6-2-2 of the operation manual.)

5. Setup extended menu setting

Item	Customer setting	Setting at adjustment
817 : EMPHASIS	_____	⇨ OFF
F01 : AUDIO NR IN SP MODE (DNW-A65P only)	ON	⇨ SW

Note

- To display the ITEM-F00 series, turn the search dial while pressing the PLAY button.
- After adjustments are completed, return the ITEM-F01 to “ON”.

5-3-3. LAU PB Frequency Response Adjustment

Prepare the following alignment tape(s) to perform this adjustment.
DNW-A65: CR8-1A
DNW-A65P: CR8-1A PS and CR8-1B PS

Measuring equipment: Audio analyzer

1. Set the audio analyzer as follows:
   Function mode: dB RATIO
   Input filter: 80 kHz LPF

CH1 adjustment (OXIDE)

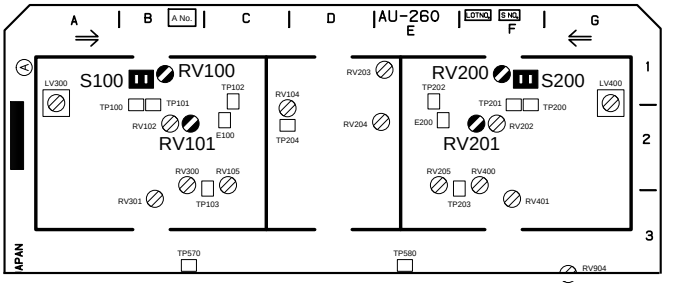
2. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
3. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS alignment tape in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
4. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.
   Note
   If the specification for RV100 adjustment is not satisfied, readjust after changing the setting of S100 (B-1) on the AU-260 board.

CH2 adjustment (OXIDE)

5. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
6. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1A / CR8-1A PS in PLAY mode, measure the audio level on the audio analyzer.
   This measured audio level is a reference level (0 dB).
7. During play back the following specified portions (−20 VU) of the CR8-1A / CR8-1A PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.
   Note
   If the specification for RV200 adjustment is not satisfied, readjust after changing the setting of S200 (F-1) on the AU-260 board.

	Specification [dB]		
Playback portion	**DNW-A65**	**DNW-A65P**	**Adjustment point**
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).		—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	C.V. ±0.4	CH-1: ⊘RV101/AU-260 (B-2) CH-2: ⊘RV201/AU-260 (F-2)
7:00 to 7:25 (10 kHz)	C.V. ±0.3	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{+1.0}_{-1.7}$	CH-1:⊘RV100/AU-260 (B-1) CH-2:⊘RV200/AU-260 (F-1)

The correction values (C.V.) are given on the label of the alignment tape.



AU-260 Board (Side A)

CH1 adjustment (METAL) for DNW-A65P only

8. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
9. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the alignment tape CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer. This measured audio level is a reference level (0 dB).
10. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

CH2 adjustment (METAL) for DNW-A65P only

11. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
12. During play back the 1 kHz, −20 VU portion (5:00 to 5:55) of the CR8-1B PS in PLAY mode, measure the audio level on the audio analyzer. This measured audio level is a reference level (0 dB).
13. During play back the following specified portions (−20 VU) of the CR8-1B PS in PLAY mode, check or adjust the dB ratio in response to each frequency portion.

Playback portion	Specification [dB]	Adjustment point
5:00 to 5:55 (1 kHz)	Measured audio level is a reference level (0 dB).	—
6:00 to 6:25 (40 Hz)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz)	C.V. ±0.3	(Check only)
7:00 to 7:25 (10 kHz)	C.V. ±0.4	(Check only)
7:30 to 7:55 (15 kHz)	C.V. ±0.5	CH-1: ⊘RV102/AU-260(B-2) CH-2: ⊘RV202/AU-260(F-2)

The correction values (C.V.) are given on the label of the alignment tape.

5-3-4. LAU Dolby Level Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A65: CR8-1A
DNW-A65P: CR8-1B PS

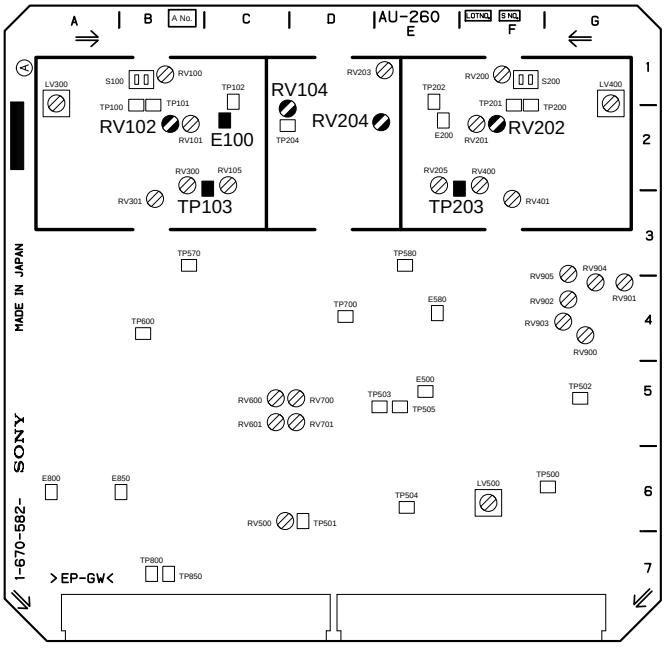
Measuring equipment: Audio level meter

CH1 adjustment

1. Connect the audio level meter to TP103(C-2) on the AU-260 board. GND: E100/AU-260(C-2)
2. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
3. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV104/AU-260(C-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)

CH2 adjustment

4. Connect the audio level meter to TP203(F-2) on the AU-260 board. GND: E100/AU-260(E-2)
5. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A / CR8-1B PS in PLAY mode.
6. Adjust the audio level on the audio level meter.
   Adj. point: ⊘RV204/AU-260(E-2)
   Specification: −10.0 ±0.1 dBu (0 dBu ≒ 0.775 V rms)



AU-260 Board (Side A)

5-3-5. LAU PB Level Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A65: CR8-1A
DNW-A65P: CR8-1B PS

Measuring equipment: Audio analyzer

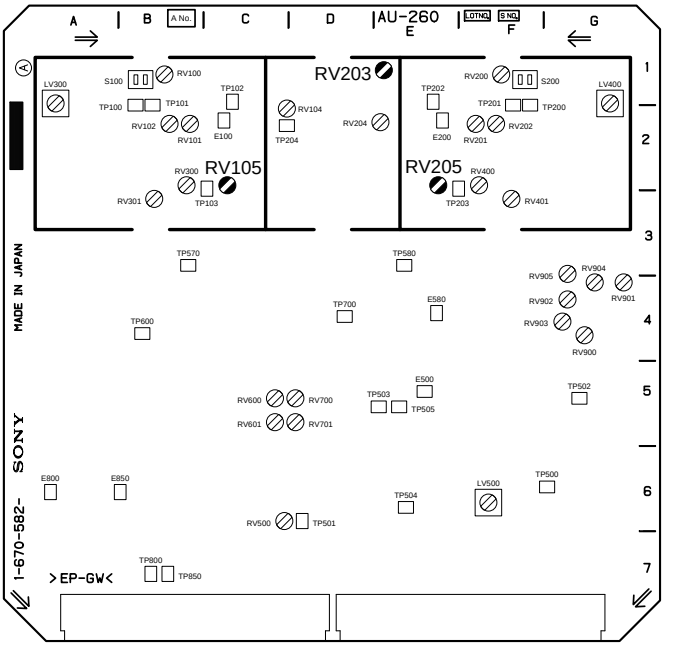
1. Set the audio analyzer as follows:
   Function mode: LEVEL, dBm (600 Ω)
   Input filter: 80 kHz LPF

CH2 adjustment

2. Connect the audio analyzer's input to AUDIO OUTPUT CH2 connector.
3. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the following alignment tape in PLAY mode.
4. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV205/AU-260(E-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)

CH1 adjustment

5. Connect the audio analyzer's input to AUDIO OUTPUT CH1 connector.
6. Play back the 1 kHz, 0 VU portion (0:00 to 2:55) of the CR8-1A or CR8-1B PS in PLAY mode.
7. Adjust the audio level on the audio analyzer.
   Adj. point: ◓RV105/AU-260(C-2)
   Specification: +4.0 ±0.2 dBm (at 600 Ω load)



AU-260 Board (Side A)

5-3-6. LAU PB Phase Adjustment

Prepare the following alignment tape to perform this adjustment.
DNW-A65: CR8-1A
DNW-A65P: CR8-1B PS

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   X-Y mode
   CH-1: Pin 2 (X) of AUDIO OUTPUT CH1 connector
   GND: Pin 1 (G) of it, AC
   CH-2: Pin 2 (X) of AUDIO OUTPUT CH2 connector
   GND: Pin 1 (G) of it, AC

   Note

   An XLR-to-pigtail cable is very convenient to connect between the oscilloscope and the above-mentioned connectors.
   Prepare two XLR-to-pigtail cables for this adjustment. And connect the XLR plug end of the cable to above-mentioned connectors and the pigtailed end to the oscilloscope. The cables for CH-1 and CH-2 shall be the same in length and same wire color on the pigtailed end.
2. For DNW-A65: Play back the 10 kHz, −10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A in PLAY mode.
   For DNW-A65P: Play back the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS in PLAY mode.
3. Watch the lissajous waveform on the oscilloscope.
4. Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.
5. Minimize the phase difference A of lissajous waveform.
   Adj. point: ◓RV203/AU-260(E-1)
   Specification: A ≦ 5.2 mm (Refer to Figure 1.)

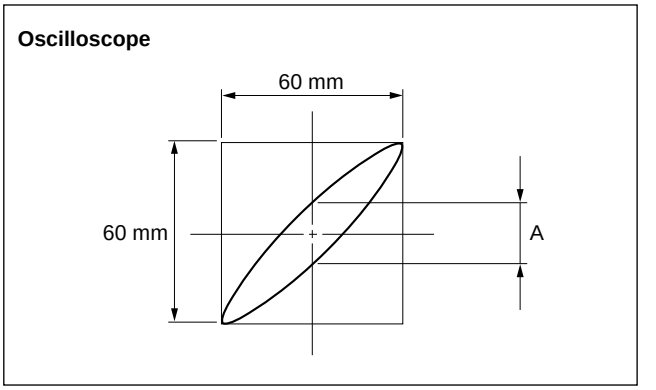


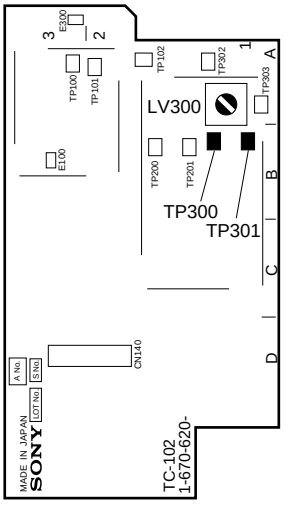
Figure 1. Lissajous Waveform of LAU PB Phase Adjustment

5-3-7. LTC Erasure Current Adjustment

Prepare the recording tape to perform this adjustment.

Measuring equipment:
Audio level meter (V rms measurement mode)
Oscilloscope

1. Connect the audio level meter to TP301(B-1) on the TC-102 board.
   GND: TP300/TC-102(B-1)
2. Insert the recorded SX tape.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A5 : LTC REC ADJUST MODE.
   - Message “Record start (Push SET)” is displayed on the video monitor.
5. To start the recording, press the SET button.
   - The REC/ERASE indicator on the lower control panel lights, and the message “Recording” is displayed on the video monitor.
6. Check the level on the audio level meter.
   Adj. point: ⊘LV300/TC-102(A-1)
   Specification: Maximum (110 mV rms or more: OK)
7. Disconnect the audio level meter and connect the oscilloscope to the same test point.
8. Check that no distortion is watched on the waveform.
9. Eject the recorded SX tape.
10. To exit the maintenance mode, press the MENU button four times.



TC-102 Board (Side A)

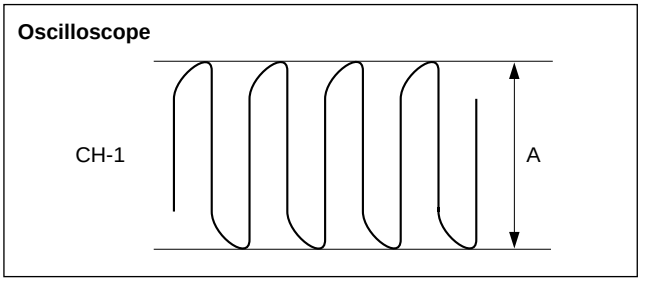
5-3-8. LTC PB Level Check

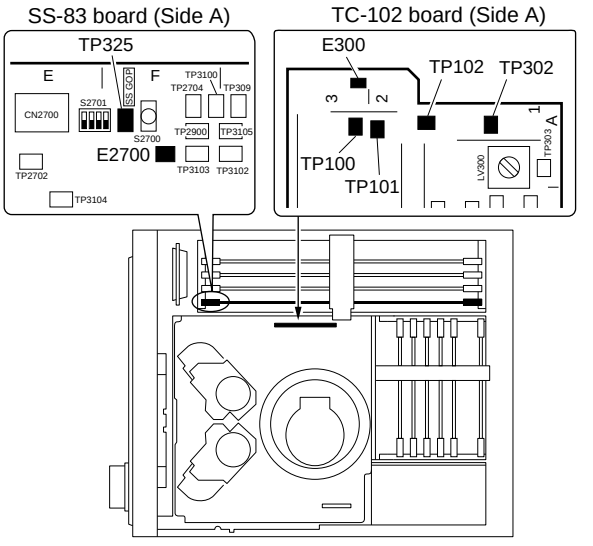
Prepare the following alignment tape to perform this adjustment.
DNW-A65: SR5-1
DNW-A65P: SR5-1P

Measuring equipment: Oscilloscope

1. Connect and set the oscilloscope as follows:
   CH-1: TP102/TC-102(A-2),
   GND: E300/TC-102(A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83(A-1), GND: E2700/SS-83(A-1)
   TIME: 100 μs/DIV
2. Insert the alignment tape SR5-1 or SR5-1P.
3. During play back the alignment tape in following PB modes, check the level on the oscilloscope in each PB mode.
   PB modes: PLAY, REW,
   SHUTTLE (−5 times speed),
   SHUTTLE (−0.21 time speed)
   Specification: A ≧ 180 mV p-p (in each PB mode)

If the above specification is not satisfied, perform “4-1. Tape Path Adjustment” again.





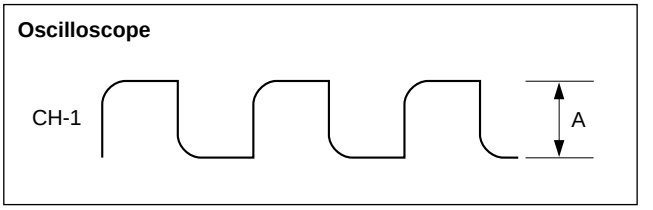
5-3-9. LTC OA Check

Prepare the recorded SX tape to perform this adjustment.

Measuring equipment: Oscilloscope
Time code reader

REC check

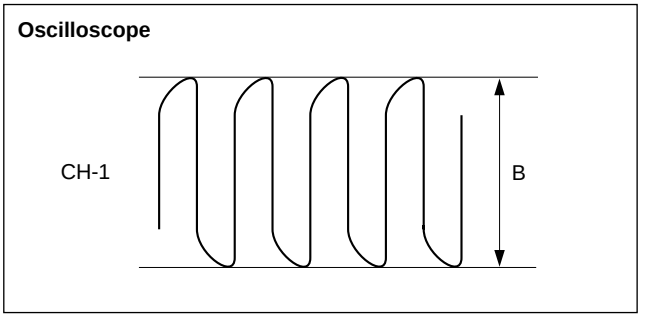
1. Connect and set the oscilloscope as follows:
   CH-1: TP100/TC-102(A-2),
   GND: TP101/TC-102(A-3), DC 100 mV/DIV
   TRIG: TP325/SS-83(F-1), GND: E2700/SS-83(F-1)
   TIME: 100 μs/DIV
2. Insert the recorded SX tape.
3. To enter the maintenance mode, press S1101(L-1) on the SS-83 board.
4. Enter A5 : LTC REC ADJUST MODE.
   • Message “Record start (Push SET)” is displayed on the video monitor.
5. To start the recording, press the SET button.
   • The REC/ERASE indicator on the lower control panel lights, and the message “Recording” is displayed on the video monitor.
6. Check the level on the oscilloscope.
   Specification: 60 ±5 mV p-p

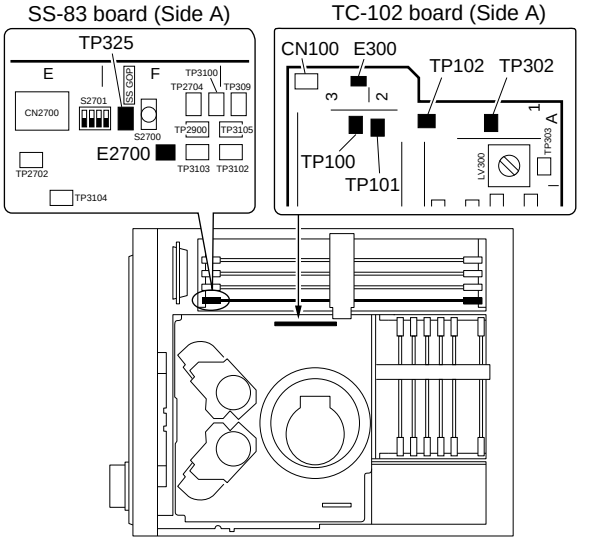


7. Press the STOP button to stop the recording.
   • The REC/ERASE indicator is off, and the message “Record stop” is displayed on the video monitor.

PB check

8. Connect the input of the time code reader to TIME CODE OUT connector of the DNW.
9. Change the connection of oscilloscope as follows:
   CH-1: TP102/TC-102(A-2)
   GND: E300/TC-102(A-3)
10. During play back the recorded portion at step 5 in PLAY mode, check that the time code can be read on the time code reader.
11. During play back the recorded portion at step 5 in following PB modes, check each level on the oscilloscope.
    PB modes: PLAY, REW,
    SHUTTLE (−5 times speed),
    SHUTTLE (−0.21 time speed)
    Specification: B ≧ 180 mV p-p (in each PB mode)





Erase ratio check

12. Press the MENU button.
    - Message “Record start (Push SET)” is displayed on the video monitor.
13. Press the SET button. (Perform the normal recording.)
    - The REC/ERASE indicator on the lower control panel lights, and the message “Recording” is displayed on the video monitor.
14. Press the STOP button after 30 seconds.
15. Rewind the recorded portion by 15-second’s portion.
16. Disconnect a harness from CN100(A-3) on the TC-102 board.
17. Press the MENU button.
    - Message “Record start (Push SET)” is displayed on the video monitor.
18. Press the SET button. (Perform the non-recording.)
    - The REC/ERASE indicator on the lower control panel lights, and the message “Recording” is displayed on the video monitor.
      In this time, a erase head operations only.
19. Press the STOP button after 15 seconds.
20. Reconnect the harness to CN100 on the TC-102 board.
21. Rewind to the record-started point in step 13.
22. During play back the normal recording portion in PLAY mode, check the level on the oscilloscope.
    Specification: B ≧ 180 mV p-p
23. Change the setting of oscilloscope as follows:
    CH-1: DC 20 mV/DIV
24. During play back the non-recording portion in PLAY mode, check the level on the oscilloscope.
    Specification: B ≦ 4 mV p-p
25. Eject the recorded SX tape.
26. To exit the maintenance mode, press the MENU button four times.

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